REPORT

OF THE

TEXTILE FACTORIES LABOUR COMMITTEE

APPOINTED BY THE GOVERNMENT OF INDIA ON THE RECOMMENDATION OF THE SECRETARY OF STATE FOR INDIA ON THE 17TH OF DECEMBER 1906 TO ENQUIRE INTO THE CONDITIONS OF

FACTORY LABOUR IN INDIA

WITH APPENDICES



BOMBAY
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1907

REPORT OF THE TEXTILE FACTORIES LABOUR COMMITTEE appointed to enquire into the conditions of Factory Labour in India by the Government of India on the recommendation of the Secretary of State for India under Resolution No. 9974-9993-13, Department of Commerce and Industry, "Factories," dated Calcutta, the 17th December 1906.

The Resolution reads as follows:—

"[illegible] of State for [illegible] Committee [illegible] ries in this country. The investigation will be directed, in the first instance, towards ascertaining the actual conditions prevailing in India, and the observations of the Committeee in this respect will supplement the reports recently received from Local Governments on the subject.

"2. The enquiries to be made by the Committee will be directed more particularly towards the settlement of the questions set forth in paragraph 3 below; but they may also put forward recommendations for the amendment of the existing law or practice, if they are of opinion that the present hours of work of operatives are excessive, that the conditions of factory labour are otherwise injurious or oppressive, or that abuses exist in connection with the employment of children or young persons. The Government of India desire that it should be clearly understood that the enquiry now to be held is preliminary only. Should the investigations of the Committee establish the existence of abuses which require to be remedied, a representative Commission will be appointed to consider the whole subject comprehensively before any radical changes in the present factory law are made.

"3. Subject to the provisions of paragraph 2 above, the specific points referred to the Committee are as follows:—

(1) Whether the working hours of adult males should be limited, and whether the physique of operatives is affected by long hours.

(2) Whether before children are allowed to work in factories certificates of age and fitness should be required.

(3) Whether the minimum age of children should be raised beyond nine.

(4) Whether, as the result of employment as adults of persons between the ages of twelve and fourteen, there has been physical deterioration requiring the creation by law of a special class of workers known as young persons.

(5) Whether a separate staff of Medical Factory Inspectors should be entertained.

"4. The Committee will consist of:—

Commander Sir H. P. Freer-Smith, R.N., late Superintending Inspector for Dangerous Trades in England. *President.*

Lieutenant-Colonel J. F. MacLaren, M.B., I.M.S., Civil Surgeon, Allahabad.
Dr. J. A. Turner, M.B., D.P.H., Health Officer, Bombay Municipality. } Members.

The Committee will assemble at Bombay on the 21st December, and it is anticipated that their report will be submitted to the Government of India in the beginning of April."

Supplementary to this Resolution it was suggested by the President of the Committee to the Government of India that the enquiry should be extended so

as to include the fencing of dangerous machinery and in answer to that suggestion the following reply was received:—

"With reference to the Resolution issued by this Department, No. 9974-9993-13, dated 17th December 1906, on the subject of the Factory Labour Committee, I am desired to explain that, although the question of the fencing of dangerous machinery has not been expressly mentioned in the Resolution as one of the points requiring investigation it has been settled, in the telegraphic communication with the Secretary of State for India, that this matter will not be excluded from the scope of the Committee's enquiries."

General Remarks.

In the agreement entered into between the President and the Secretary of State for India it was stated that "he should proceed to India and report on the hours of work and conditions of labour in Indian Factories and such other matters connected therewith as the Government of India might direct;" his duties were not originally confined to Textile Factories, but it was subsequently decided that the scope of the enquiry should extend to Textile Factories only. The Indian Factories Act does not discriminate between Textile and non-Textile Factories, but a proposal made to the Government that the definition in the English Factory Act should serve as a guide was approved.

In a despatch addressed by Lord Cross to the Government of India, dated 15th May 1890, it was pointed out that in regard to any additional factory legislation in India, due regard must be had to the circumstances of the country which are in many respects different from those of any European nation. The difficulties appreciated then apply with equal force now, the constitution and habits of the Indian worker being entirely different to those of the European. On the other hand during the many years that have elapsed experience has been gained, the Indian workers are becoming more accustomed to mill life, and it is believed that, without imposing any restrictions that will be unduly felt, amendments might be introduced into the Factories Act which would secure uniformity in regard to administration in the various works throughout the country and add materially not only to the health and comfort of the workers, but also to others engaged and interested in textile trades in India.

It has been suggested in estimating the amount of work done by mill workers in India that comparison to be of any value should not be confined to the periods of employment worked by Europeans in their own country, but should extend as far as possible to other Eastern nations.

Unfortunately reliable statistics are difficult to obtain, but quotations from the few who have written on the subject will be referred to hereafter, and individual evidence given by mill managers with experience in China, and elsewhere will be quoted.

It was felt by the Committee that however efficient might be the administration or however well considered the laws relating to Factories, no real or permanent good would follow unless in many instances serious attention is paid to the homes and surroundings of the mill hands. Large numbers of workers from country districts are imported into manufacturing centres rendering the housing question extremely difficult for municipal and other authorities. It was thought that the homes of the workers should be visited and inspected, and this was rendered possible owing to the intimate local knowledge of, and the facilities placed at the disposal of the Committee by, one of the members.

Accompanied by Rao Bahadur Vithalrao Krishnaji Vandekar, President of the Committee, (who submitted to Lord Curzon a memorial from the mill hands of Bombay, *see* proceedings of the Department of Commerce and Industry, "Factories," April 1906) and others, visits were made to "challs" occupied by workers in the vicinity of mills in the Parel District, Bombay.

The conditions can only be described as deplorable. After making allowance for the very limited space which will satisfy Indian workers and their families, the houses were distinctly overcrowded, dark, damp and ill ventilated. *Admission of fresh air seemed a practical impossibility,* for the dwellings were surrounded by narrow gullies for carrying off waste water and sullage. The offensive vapour from these gullies permeating the whole of the surrounding atmosphere.

The method of disposal of the excreta is the basket hand removal system so common to many parts of Bombay.

It is perfectly evident that these baskets are saturated with highly offensive excreta and this in conjunction with insanitary conditions mentioned must tend to lower the individual vitality of the worker. It was no astonishment for the Committee to see the mark fixed by the Health Department on a large proportion of the dwellings, showing that cases of cholera had occurred in them. Although not identical in all respects similar conditions *were observed in other large manufacturing centres visited by the Committee.* In many country districts where space, and land of less value is available, sanitary conditions are defective, but there is abundance of open area and fresh air to counteract in some measure any insanitary defects.

It must not be inferred that the sad conditions described are universally found. The Committee desire with much satisfaction to point out what has been done and what can be done by individual effort and the measures taken or contemplated by public bodies.

In Bombay we learn that the Bombay Improvement Trust and the mill owners are carrying out schemes for the improvement of congested areas and provision of better dwellings for the working classes throughout the city.

It is realized by the Committee that the health and happiness not only of the vast number of the workers of Bombay but also of their children is so largely dependent upon the early execution of real and practicable schemes that they express a sincere desire that as little delay as possible may occur in giving effect to proposals now in contemplation.

Referring to individual efforts in various parts of India, arrangements not only for housing the workers but for in every way adding to their comfort were explained to and witnessed by the Committee. In many of the places referred to model villages are found in which all that can be conceived to secure *health and comfort has* been *provided by owners of works at their own* cost, the workers only paying a nominal rental. Detail in the body of this report would occupy too much space.

Summary of work done by the Committee.

The Committee assembled at Bombay on the 21st of December 1906 when the President reported himself to the Secretary to Government and subsequently with the other members looked over numerous papers bearing on the work to be undertaken.

From the 21st December 1906 to 20th January 1907 with the exception of 6 days spent in Ahmedabad, the members were actively engaged in visiting works in Bombay, in collecting information of a general character and in taking evidence. On 7th January a formal meeting was held when an interview took place with the members of the Chamber of Commerce and the members of the Mill Owners' Association. It was then suggested that evidence of representative witnessess should be taken at a later date and points for consideration were *submitted to them by the Committee.* In Ahmedabad a large proportion of the mills were visited, evidence taken from the local Magistrate, the Official Inspector, Owners, Managers and groups of mill hands.

On the 20th January the Committee left Bombay for Calcutta arriving on the 22nd. *Until 3rd February the time* of the members was employed in conferences with mill owners, visiting works and in taking official and representative evidence.

On the 3rd February they proceeded to Madras arriving on the 5th and remaining till the 10th. Here all the mills in the city were visited and as elsewhere, officials, mill owners, managers and operatives were examined.

Returning to Calcutta on the 12th February more mills were inspected, the evidence of Civil Surgeons and Medical Inspectors taken, also that of the representative members of the Bengal Chamber of Commerce and the Jute Mills Association.

Leaving Calcutta on the 16th the Committee arrived at Delhi on the 18th, remaining till the 21st, then to Agra where 3 days were spent, then to Cawnpore arriving on the 24th where they remained for 4 days. At Delhi, Agra and Cawnpore all mills were inspected and as in other places the evidence of operatives, mill owners, managers and workers taken. At Cawnpore the Committee had a special meeting with the Upper India Chamber of Commerce when formal evidence was taken.

The Committee then travelled to Nagpur arriving there on the 1st March. In Nagpur all the Cotton Mills and Ginning Mills were visited, the usual evidence was taken and in addition an exhaustive written statement, very carefully prepared, was handed in by Mr. Bejonji Dadabhoy, the experienced Manager of the Empress Mills.

On March the 3rd the Committee left Nagpur arriving in Bombay on the morning of March the 4th. Several days were spent in taking formal and detailed evidence from witnesses suggested by the Bombay Mill Owners' Association. The time of the Committee otherwise was devoted to collecting general information to drawing up report and to conferences, seeing witnesses and special enquiries at works.

It was clearly understood from the beginning that the evidence taken would not be published. Reports, however, of all evidence taken have been printed and forwarded to the Government of India.

A list of witnesses appears in Appendix E.

The works visited by the Committee are mentioned in Appendix D.

Administration.

The question of efficient administration is one calling for serious consideration. Laws especially those relating to labour may if inefficiently administered do little good indeed, in many instances may do harm. Employers of labour are apt to consider that where there is State intervention they are relieved of their responsibility and that it is the duty of officials to see the law carried out.

In the first instance the Committee would say with the greatest confidence that no legislation with regard to the questions under consideration will fulfil the end in view if such legislation is of a permissive character.

Certain clauses in the Indian Factories Act on which depends the whole system of child labour in India are stated by the officials administering the Factory Laws to be of a permissive character.

The intention of Government can hardly be questioned; it was intended that children should not be employed in mills under the age of 9 years, that they should not work on full time, or otherwise as adults until the full age of 14 years was reached, and that efficient measures should have been taken by the management to fulfil these requirements.

The different methods and the different forms vary in the different parts of India. To this reference will be made hereafter. The following remarks which will illustrate the points for consideration relate to Bombay.

Rule 19 lays down that the occupier of every Factory should keep in form A a register of children; as a matter of fact this register is generally kept, but is used for a purpose other than was intended.

The certifying Surgeons in Bombay bracket together a large number of children, place their initials against these groups, stating against each name simply whether the child is over 9 years or under 14 years.

By the rules and orders No. 21 issued by the Government of Bombay every occupier is required to keep a register in a bound book, each page to be numbered and to contain certain particulars. On this form there are

concise and elaborate details relating to the children, there are columns to be signed by the certifying Surgeons, there are detailed instructions in regard to the certificates and what is to be done with them. Excepting at Ahmedabad and one Factory in Bombay these instructions have not been observed and might for all practical purposes have never been issued.

The Committee have borne in mind that although their reference has been confined to Textile Factories, there are large numbers of other industries employing women and children. The report of the Collector of Bombay shows that in the year 1904 there were in the Bombay Presidency 75 separate industries using steam power and within the scope of the Act. The numbers are likely to increase and in considering any system which may be drawn up with a view to securing uniformity of administration and efficient inspection it has been necessary to look ahead.

In the opinion of the Committee the administration at present in force leaves much room for improvement. Laws that are good for a Cotton Mill, a Flour Mill, an Iron Foundry, Engineering or other works, if good for Bombay or Calcutta, are equally good and equally called for, for similar works all over India, but as a matter of fact the rules made by different Governments differ in important details.

Inspection.

The System of Inspection also differs. For instance in Bombay City—Bombay [illegible] —the office of the Chief [illegible] We find in the report [illegible] 1905 that the post of Chief Inspector was held by six separate gentlemen. Each of these also held the office of Assistant Collector and was subject to the control of the Collector of Bombay. There is a 1st Inspector of Factories appointed by the Local Government, an Uncovenanted Civil Servant, who has not passed any special, technical or other examination and whose time is largely taken up by other duties (excise, &c.).

There is a Joint Medical Inspector Personal Assistant to the Surgeon General, and there are 3 Presidency Surgeons ex-officio Certifying Factory Surgeons. In the Presidency, Inspections are carried out by the Collector and District Magistrate assisted by the Assistant or Deputy Collector and the Special Presidency Inspector, an Uncovenanted Civil Servant.

In Calcutta the Special Inspector of Factories reports to the Commissioner of Police and appears to be directly subordinate to him. In Madras both the Special and the Medical Inspectors report to the Sanitary Engineer to Government, while outside the Presidency town the work of inspection falls to various officials including Civil Servants, both European and Indian. In the Punjab the inspection is done by the Deputy Commissioner or by some one deputed by him. In the United Provinces inspections are carried on by Civil Surgeons, District Officers and by the Special Inspector of Factories from Calcutta. In the Central Provinces such work is done by Deputy Commissioners, Civil Surgeons and the Special Inspector of Factories of the Bombay Presidency.

Bearing in mind the ever growing importance of Factory legislation in India due to the rapid growth of industrial occupations and the absolute necessity for uniformity in Administration, the Committee would submit that the working of the Factories Act should be primarily under one official under the Department of Commerce and Industry, that for purposes of inspection, carefully considered districts should be placed in charge of competent inspectors recruited perhaps from the ranks of English Factory Inspectors with a thorough knowledge of the many and varied duties to be performed by an official exercising supervision over a large number of separate and distinct industries, or [illegible] should [illegible] btain a [illegible] period under an experienced Inspector in some large industrial centre in Great Britain.

Whether a separate staff of Medical Inspectors should be appointed.

The point referred to the Committee as to whether a separate staff of Medical Inspectors should be appointed has been very carefully considered. On the desirability of making such appointments the members of the Committee are quite agreed.

They are of opinion that a number of Medical Officers should be assigned to separate areas, these to depend on the number of works and the facilities for reaching them and that their whole time should be devoted to the work of Factory Inspection.

They are of opinion that, subject to the Department of Commerce and Industry on all medical questions they should be the supreme authority. The Committee would not advise that the Special Factory Inspectors be relieved from duties relating to Sanitary matters but on these points should take their instructions from the Medical Inspectors and refer to them on all doubtful points.

Suggested duties for Medical Inspectors.

Some of the duties to be assigned to the Medical Inspectors may be enumerated as follows, attention to—

(1) Water-supply.

(2) Ventilation including the carrying off of dust and noxious fumes. When mechanical appliances are required arrangements should be made in conjunction with the Special Inspectors.

(3) The purity of air and amount of Humidity.

(4) Temperature.

(5) Cubic space.

(6) Cleanliness and Lime-washing.

(7) The Drainage of Floors.

(8) Sanitary Accommodation.

(9) Investigation and reports on accidents in conjunction with Special Factory Inspectors.

(10) Diseases of occupation such as Anthrax, Lead—Arsenic and Phosphorus poisoning—Disease of Respiratory Organs, &c., and also

(11) To satisfy themselves that women and children are physically fit for the work they are called upon to perform.

In making the above recommendations the Committee have not forgotten that many of the duties now suggested are already performed by Civil Surgeons holding the office of Medical Inspectors. They are however satisfied that owing to the many and important duties that Civil Surgeons are called upon to perform they cannot devote the time required for the efficient Medical Inspection of Factories. In many cases the Civil Surgeon is necessarily the Medical attendant to the Mill and in all probability his wishes would be best consulted were he relieved from making official inspections in places where owners, managers and workers are under his medical care.

The Committee wish to make it clear that in their opinion the work of Medical Inspection should be performed by specially appointed Medical Officers, who should devote their whole time to the work and that this work should be confined solely to them except the duties now performed by Certifying Factory Surgeons.

In submitting the above proposals the Committee remember that Executive officers are responsible for the administration of laws and should control the officials under the different Governments appointed to administer these laws. It might be desirable that the Medical Inspectors should be immediately subordinate to the Local Government, but exercising supreme control over all other Inspectors. The Medical Inspector for Bengal might also act as Technical Adviser to the Department of Commerce and Industry. If, however, the Medical Inspectors are called upon to perform these duties and advise generally on technical matters in Factories, it is suggested that prior to appointment they should be given opportunities for technical study in works in Great Britain and perhaps on the Continent.

The Committee however desire to point out that the Supreme Government (the Department of Commerce and Industry) should at all times be able to command the opinion of an expert, skilled in Factory law and Factory administration and that they should not have to depend on the advice of officials however capable in other matters but who from time to time are removable and have many and other responsible duties to perform.

Certificates of Age and Physical Fitness.

I.—Age.—In the opinion of the Committee the present law relating to certificates of age calls for drastic and immediate reform. The intention of the Factory Act is to protect children from over-work, and *further that children* should not be classed and worked as adults before they have attained the prescribed age of 14 years laid down by law.

The procuring of these certificates is apparently, as the law stands, purely permissive. In some works they are procured, in others they are not. Some occupiers profess to obtain age certificates but they are asked for at uncertain times. It having frequently come to the notice of the Committee that in mills where hundreds of children are employed, and where nominally certificates of age were procured, that there had been no visit from the Certifying Surgeons for periods varying from several to eighteen months, nor had the children been sent to the Surgeon.

It was the evident intention of Government that these certificates should be procured and special forms were drawn up with detailed and full instructions as to how they should be filled in and what use should be made of them, but as has been before stated, in many parts of India, the forms have not been used and might as well never have been drawn up.

In the opinion of the Committee the law should require that no child under the age of 14 years "*shall*" be employed in a factory until he produces a

The original certificate to be the property of the child, carried by him when at work and produced when required by the Factory Inspector or other person authorized to require its production.

Should a child employed in a factory resign or be discharged, an endorsement to that effect by the Manager should be made on the original certificate, giving the date, a similar endorsement should be made in the duplicate and register.

On applying for employment in the same or other factory, it will be sufficient proof if the child produces the original certificate, endorsed by the late employer. Failing this, a fresh examination of the child will be necessary and a fresh certificate given.

In support of
to be raised to the
commodity and ris
cular emphasis on
certificate adopted is that laid down under rule and order 21 made by the *Bombay Government on* 22nd June 1892. A space, however, has been added for "personal marks." In going through the several factories in Ahmedabad there was absolutely no difficulty in identifying the children. A duplicate of the certificate kept in the office was carried in a small tin receptacle and worn by the child when at work.

Walking through the mills the members of the Committee called large numbers of children who at once produced their certificates, and, by the personal marks stated, identification was easy. In some instances the marks stated on the certificates were not found on the worker. These workers were sent to the office, and subsequent investigation showed that certain children living in the same house had inadvertently taken the case belonging to another child.

It is strongly urged that the insertion of personal marks on the certificate should be a legal requirement and that the age should as far as possible be approximately stated, and it is thought that in addition to this a thumb-mark
-mark are
would be

the certificate.

The cost and trouble of requiring such a mark would be practically nil.

A copy of the proposed form of certificate is given below:—

(Duplicate.)

FACTORY ____________

I ____________ being a duly appointed Certifying Surgeon under the Indian Factories Acts, 1881 and 1891, hereby declare that I have personally examined the person hereinbelow described and believe him/her to be of the approximate age of ____ years and that he/she is not incapacitated by disease or bodily infirmity for working daily the time allowed by law for (1) a child, or (2) an adult, in any factory under the above Acts.

1	2	3	4	5	6	7	8	9	10
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]					[illegible]				

(Back of Certificate.)

(Duplicate.)

Date on which Certificate No. ______ belonging to __________ was received by the management of ________ works

Date.	Signature.
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

(Original.)

FACTORY ____________

I ____________ being a duly appointed Certifying Surgeon under the Indian Factories Acts, 1881 and 1891, hereby declare that I have personally examined the person hereinbelow described and believe him/her to be of the approximate age of ____ years and that he/she is not incapacitated by disease or bodily infirmity for working daily the time allowed by law for (1) a child, or (2) an adult, in any factory under the above Acts.

1	2	3	4	5	6	7	8	9	10
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]					[illegible]				

(Back of Certificate.)

(Original.)

Date on which Certificate No. ______ belonging to __________ was returned by the management of ________ works.

Date.	Signature.
1	
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Under section 3, paragraph (2) of the Government of India resolution of December 17th, 1906, a report is called for as to whether, before children are allowed to work in factories, certificates of age and physical fitness should be required. The views of the Committee in regar[illegible] stated. An equally important question, namely, [illegible] fitness for employment should be required has e[illegible] It will, of course, be remembered that from th[illegible] legislation affecting the United Kingdom, this certificate has been required, and presumably, if valueless, the united influence and intelligence of the manufacturers of Great Britain would have been sufficiently powerful to secure the [illegible] In England the exact age of [illegible] be ascertained. In India this [illegible] physical condition being considered and stated in addition to a merely speculative statement in regard to age. The arguments adduced by many manufacturers, whose opinions are worthy of careful consideration, have not been forgotten.

It is urged by them that it would be contrary to their interest to employ weakly children, but personal supervision on the part of the management in regard to matters of detail of this kind is difficult, if not impossible. They must to some extent depend upon subordinates who will be tempted to engage the willing child even if physically unfit. It has also been urged that a child physically fit today may be utterly unfit after a limited period following examination. This argument applies to every walk in life, but a medical examination would at any rate discover constitutional or other defects rendering the child unfit for mill labour. The direct reference appears to be confined to whether a certificate should be required for children *before* employment, but the Committee is empowered to put forward recommendations for the amendment of the existing law or practice. In their opinion serious abuses exist and have for long existed in regard to employment on full time of so-called adults professing to be 14 years of age, but in reality one or two or even three years below that age. It is common to find children certified as being over 9 in one year employed within a period of say 12 months on full time. The proof other than the evidence of one's observation is difficult to obtain, conviction in Court almost impossible, for the offence, as stated would have to be for employment of a child below a certain age, evidence would have to be produced on both sides, and as has frequently been the case, there would be a direct conflict of opinion. Could an information be laid for employment without a certificate from the duly appointed Certifying Surgeons, who should be the authority, all this would cease. Difficult as it is to obtain direct evidence in regard to age, the Committee have [illegible]

[illegible] fact that in Bombay a system of birth registration has been in force for a number of years. But a large proportion of mill children are born out of Bombay.

Within the last few years this system of birth registration has been elaborated and rendered more perfect, so that in a few years it will be possible for every child born or vaccinated in Bombay to produce some documentary evidence of his age to the Certifying Surgeon, and there appears no reason why this documentary evidence should not be procurable in the future in other large centres of industry throughout the country.

Measures to prevent the abuses described appear to be certainly called for. The one most likely to be efficacious is probably a requirement that *before* [illegible] of age and fitness should be [illegible] but these are not insuperable. [illegible] ain this certificate, that the person employed represented himself or herself to be above 14 years of age. [illegible] l, and it is suggest- [illegible] Further reference [illegible] eading of "Young Persons."

Minimum age for Employment of Children.

By the Indian Factories Act of 1891 (XI of 1891) it was laid down that no child shall be employed in any factory if he is under the age of nine years and it is submitted for the consideration of the Committee by Government Resolution whether the minimum then fixed should now be raised beyond nine years.

This question has been considered from every point of view and due weight has been given to the evidence of competent witnesses. Were there educational facilities for school attendance throughout the country, the Committee would not have any hesitation in suggesting that the limit of age for employment of children should be raised, but as this is not the case, they have to consider whether any kindness would be done to the children by preventing them from working at the age of nine in well ordered factories. If so prevented, it is feared that many of these children would be employed in places not under the Factories Act where the conditions of labour are much worse, or they might be employed in much more exhausting work in general labour, or if unemployed, they would possibly be idling in the Bazaars instead of honestly earning a small sum towards the family expenses.

Education of half time children.

It has been noticed with great satisfaction in many mills throughout India that schools on the mill premises have been provided by employers. Witnesses having a wide knowledge of mill life in India, and the habits of the workers, have strongly urged that the law should require the provision of a competent elementary teacher and suitable accommodation for educational purposes on the mill premises. It was pointed out that the expense would be very little—about Rs. 15 to Rs. 20 per mensem—It is submitted that this proposal should receive careful consideration. Should such a system be adopted it would seem desirable at a later stage, that the minimum age for employment should be raised.

Systems of employment of children.

It may be well perhaps at this stage to refer to the systems, or in some cases to want of system, under which children are employed in Factories. Different methods are in force in different parts of the country. In some mills the children are divided into two sets, one set working beforenoon, the other in the afternoon. Sometimes the sets are changed weekly, but this practice is by no means universal. In other mills one set works from 6 A.M. to 9-30 A.M. and again from 1 P.M. to 3-30 P.M. and the 2nd set from 9-30 A.M. to 12-30 P.M. and again from 3-30 P.M. to 6 P.M.; in the interval children are attending the mill school. With slight variations this latter system is found throughout India. In some mills no system of any kind is adopted, the children coming in the morning when the mill starts, and leaving in the evening when the mill stops; they remain on the premises during the day, the over-lookers arrange when they shall work and when they shall not work, and profess to exercise supervision which will prevent any child from exceeding the seven hours of work allowed by law.

It is obvious that great irregularities must exist in such mills. In one very large mill in which nearly 400 children were employed, the European Manager assured the Committee that there was no such thing as half-time employment in any mill, nor did he know of a Factory Act restricting child labour in this way. Another European Manager at this mill disagreed and said that the work was carried on in shifts, but he admitted that when there was pressure, work would continue beyond the specified period, that there was a disregard for these shifts, and there was nothing to prevent children in the first shift from also working in the second. The first Manager wrote to the Committee afterwards and said that on further enquiry he found that the children did work in shifts.

It is strongly urged that the law shall require that children shall only be employed on some recognized system, that precautions shall be taken to prevent children working in one shift from being employed in another, and probably this would be secured by adopting the recommendations made by the Bombay Government, General Department, which appeared in the *Government Gazette* dated December 6th, 1906 (Part I), page 1802. (See Appendix H.)

Employment of Women.

So far as the day employment of women is concerned, from personal observation in large numbers of works, and after consulting many authorities, the Committee are satisfied that amendments or alterations in the present law are uncalled for.

Women are chiefly employed as "reelers" and "winders," the rooms in which they work are speaking generally lofty, clean and well ventilated, the work is of suitable character, they are paid by piece-work, and in many instances by their wish do not work the full time allowed by law—In short the lot of the women employed by day in mills is far superior to that of women workers generally engaged in other classes of work in India.

Employment of women by night.

The employment of women by *night* however must be considered from a different point of view. By Section 6 of the Indian Factories Act, where a system of shifts approved by the Local Inspector is in force the employment of women at night is allowed. As a matter of fact however it is quite exceptional to find that in ordinary Textile Factories women are employed at night. The numerous witnesses examined by the Committee, in works and elsewhere, appear to be decidedly opposed to such labour, and this view is supported by the Committee.

W[illegible] either [illegible] ild be [illegible] ieared [illegible] must [illegible] work [illegible] future offspring. Her home will be neglected, and she will frequently be called upon to work on household duties in the day after working a whole night in the mill. It is believed that, although temporary inconvenience might follow the prohibition of night work by women, chiefly in Ginning Mills, this would not be felt were reasonable time allowed for occupiers to make other arrangements.

There are, as has been stated, over 1,000 Ginning Mills in India; in a very large proportion of which the health of women is being injured by night work. This is a serious question calling for serious attention. It will of course be urged that work continues for only a few months of the year varying from 3 to 5 months, that the supply of cotton comes at irregular times, and that delay in the manipulation, may lead to serious loss, but against this, it must be remembered that a boy aged fourteen can work as an adult, and by gradually making arrangements for the work to be done at night by male adults, the inconvenience could be greatly lessened if not entirely removed.

The Committee understand that the consideration of the question of employment of women at night, has on the suggestion of the Berne Conference been submitted to the Government of India so this seems an opportune time for recording the views here expressed.

Presence of infants and young children in works.

Reference has here been made to the fact that women bring young children to the works with them. This practice is by no means [illegible] early all [illegible] Textile Factories throughout India. To absolutely prohibit this custom, might keep large numbers of women out of the works and thus prevent them from earning a livelihood. On the other hand, it appears that by suitable administrative regulations, infants and young children could be kept away from the running machinery, from rooms in which the inhalation of dust, and impure vapours, is likely to injure their health, and doubtless after consideration, suitable regulations could be drawn up.

Adult Male Labour.

Whether the working hours of adult males should be limited, and whether the physique of operatives is affected by long hours, are questions which perhaps

should be separately considered. On no point relating to Factory Law has the public mind been more exercised than on the question whether restrictions should be placed on the hours of adult males by legislation. Authorities holding high official offices, employers of labour, and representatives of different schools of thought have in emphatic terms expressed their views. Under these circumstances much and careful consideration has been given before arriving at the conclusions now submitted. The Committee would prefer not to draw comparisons between mills in Lancashire, and mills in India, but unhappily such comparisons have been made, and will be made, when this report is under criticism.

Furthermore comparison is to some extent necessary, as in arriving at conclusions in regard to what can be fixed as a reasonable limit of endurance for male adults, one has to consider the conditions under which they work, the amount of physical strain suffered, and the relative production resulting from their labour.

Temperatures in English and Indian mills compared.

It has been frequently pointed out that the Indian workman is employed in rooms in which excessive temperatures prevail, that his hours of work are greatly in excess of those of men in mills in the United Kingdom, but against this it must be remembered that temperatures which are excessive to the European are borne with comfort by the Indian worker and also that when the tables of temperature and humidity to be found in Appendix A of this report are considered, it will be seen that in many of the best regulated mills, efficient means for cooling the air, are taken and that except for the hottest weeks of the year, the temperature is probably not of a kind that would cause ill health or serious discomfort to the Indian worker.

In English Mills, especially where fine counts are spun, excessive temperatures are certainly not unknown, and the discomfort to the workers must be far greater than that caused to his Indian colleague. The tables in Appendix A of this report will show that the English worker especially in winter is daily subject to great variations of temperature. In the spinning rooms where he spends the better portion of the day, excessive temperatures sometimes approaching 100° Fah. are found, the outside temperature in winter being often at or below freezing point, but at all times, very far below the temperature of the spinning rooms. In India inside and outside temperatures vary only to a very limited extent.

Comparisons relating to number of workers on each machine in England and India.

Comparisons must also be made between the numbers of workers employed on each class of machine. From various reliable sources tables relating to India have been procured. These will be found in Appendix B and also similar information relating to Cotton Mills in Lancashire supplied by His Majesty's Inspector Mr. Lewis, and to Jute Mills in Dundee by His Majesty's Inspector Mr. Buchan.

Habits of Indian Workers.

No legislation can alter the nature and ingrained habits of Indian workers. They have been in the habit of leaving their work at odd and uncertain periods throughout the nominal working hours. They go into the mill compounds which generally speaking are large and open for taking food, smoking, bathing, drinking water, and necessary purposes.

In some mills efforts have been made but with only limited success to stop, or at any rate curtail these practices. The men as a matter of fact, within reasonable limits, prefer to have these short periods of relaxation when they want them, instead of longer and fixed periods for meals with the requirement that all the work done by them, must be within a more restricted period.

Unlike the English the Indian mill hand takes frequent unauthorised holidays and in some districts it is the common custom for them to give up their mill work altogether for periods varying from 1 to 3 months when they return to their homes, frequently situated in country districts a long distance from the works.

It need hardly be pointed out, that alleged trade jealousies have been excluded from the minds of the members of the Committee. The conclusions they submit are based upon what they believe to be best alike for employers and employed. By many it has been urged that restrictions on adult male labour are in England unknown, but it must not be forgotten that by many, such restrictions are strongly advocated and the eight hours' movement has many powerful and influential supporters.

In India much of the work, notably in the weaving sheds, is performed by men, whereas in the United Kingdom [illegible] hours are restricted. The introduc[illegible] led to excessive hours of running. [illegible] from about 5 A.M. to 9 P.M., in others the hours of running are less, but in busy times they would be increased. Amongst the thinking and moderate class of manufacturers [illegible]. Many meetings [illegible]orts attempted to [illegible] for the operative [illegible] undue competi[illegible] worries. These efforts have failed.

Opinions of adult male operatives.

To the best of their ability the Committee have ascertained the views of the adult male operatives themselves. They have, as will be seen from the minutes of proceedings, evidence taken and forwarded for reference to Government, endeavoured to ascertain the views of these men not only in their works but also in their homes and in situations away from their works where they had ample opportunities of freely expressing themselves.

Largely signed petitions have been received which may or may not be genuine, but measures were taken to settle this point with the aid of native experts, and the impression formed is that they are genuine. After careful thought the Committee have come to the conclusion that the workers themselves would welcome a legal limitation on the hours of their work. It was fully explained to them that this might mean reduction of wages, but this generally speaking did not shake them in their desire for shorter hours.

Alleged effects of working by the electric light.

The majority of adult operatives object strongly to the electric light alleging, rightly or wrongly, that it affects their eye-sight, and gives them headache.

Many recognized authorities on mill labour in India are strongly opposed to any interference with adult male labour, but in the mills owned by these gentlemen the hours of work will be found to be less than those submitted by the Committee.

Suggested restrictions on hours of work of adult males.

The Committee feel satisfied that without legislative interference an understanding will never be arrived at, that excessive hours will be worked and that in exceptionally busy times serious abuses greater than exist at present will creep in. After making due allowance for the numbers of workers employed in Indian mills as compared with those in England after bearing in mind the habits of the people and the irregular periods for rest which they will insist upon the Committee are of opinion that trade will not be restricted by a requirement that the period of employment in Indian mills, except those working on the shift system should be fixed either between the hours of 5-30 A.M. and 6 P.M. or 6 A.M. and 6-30 P.M., that the engine should cease for half an hour between the hours of 12 noon and 2 P.M.; that in mills working by day on the shift system, the period of employment should as at present be between 5 A.M. and 8 P.M. provided that the actual period of employment for adult males shall never in any one day exceed 12 hours and that efficient means be taken to ensure that this restriction is duly observed.

It will doubtless be urged by some that the 72 hours now proposed per week in Indian mills is by far too generous when compared with the 55½ hours allowed in English mills but to those who have carefully studied the question and read this report it will be realized that there are sound reasons for the suggestions made.

Remarks on labour in Textile Factories in Eastern Countries.

Attempts have been made by the Committee to obtain reliable information in regard to the hours worked by Adult Males in Eastern Countries. On November 11th, 1906, the President addressed a letter to the Under Secretary of State for India asking if from the Japanese Embassy any printed public documents relating to State regulations of mills in Japan could be procured.

The following papers from the Board of Trade were sent :—(See Appendix C).

(*A*) "Classification of work-people by age and sex, being a quotation from 'Japan in the beginning of the 20th century published by the Imperial Japanese Commission to the Louisiania Purchase Exhibition in 1904.'"

(*B*) "*Average daily wages.*—Extracted from the 'Financial and Economical Annual of Japan' issued by the Japanese Department of Finance."

(*C*) "Working hours in Japanese Factories" and in addition the Trade of Consular District of Kobe for the year 1905.

(*A*) shows broadly that the greater part of the Operatives in Textile Factories are females between the ages of 16 and 22 years, the number of those from 22 to 30 years coming next.

(*B*) Average daily wages are given showing that 40 per cent. of the Operatives are on time wages and 60 per cent. on piece wages.

(*C*) states that in Cotton Mills, 12 hours are the standard for both day and night workers—they being made to take day and night work by turns every 2 days.

In "Filatures" the regulation hours are 13 to 14—Power Loom Factories 12.

Page 29 of the Consular Report for the District of Kobe says under the heading of 'Industries': "It is not improbable that in Japan sooner or later, like elsewhere, the labour question will have to be dealt with by legislation." It also says: "To the casual enquirer the most urgent reform would appear to be in the direction of shortening the working hours, but this doubtless is a matter which will adjust itself."

Under the heading of the Japanese Cotton Mills which appeared in the *Pioneer* of January 17th, 1907, Mr. W. A. Graham Clark gives much useful and instructive information in regard to the Labour question and the general condition of Japanese Mills. He states that during the last 6 months, 81 out of 85 mills ran both day and night averaging over 22 hours a day, but although probably implied it is not stated that the workers are employed in shifts.

He points out that the operatives have resorted to strikes and other means to secure higher wages and shorten hours of labour. He adds that the present long hours are very oppressive, especially to employees, most of whom are girls. While doubtless there is much to learn from Japan it can hardly be urged that the system of mill labour existing in that country could with advantage be copied in India.

An experienced Mill Manager, who had spent many years in Brazil and China, states that in the latter country Adult Males where he was engaged worked for 24 hours in 2 shifts, including a stoppage of 1 hour in each 12 hours' shift. His opinion was that this system did not pay, that he often found many of the operatives asleep at night, and some of the machines not running. He also stated that at one period of his career, he managed a large mill in Brazil in which there were 40,000 ring spindles and 1,226 looms, where the hours were 12 hours per day with half an hour's rest.

Physique of Operatives.

Passing to the second portion of reference 3 (1), *viz.*, whether the physique of operatives is affected by long hours, the Committee examined Medical Inspectors at nearly every place visited. They almost all expressed the opinion that sufficient evidence was not forthcoming to make definite statements, but two were of opinion, as far as they could judge from casual observation, that no

"deterioration from long hours was seen," while one said that "all workers suffered in health," although he had no evidence to give, to support his statement. The Health Officer of Calcutta could furnish no statistics relating to the health of mill operatives.

Opportunities were taken to examine mill workers themselves as to the effect of mill labour on their health, but their replies were of a contradictory and unreliable character. In Bombay some labour statistics are available but only for the past 6 years, and from them it is gathered that the mean Death Rate from Phthisis per 1,000 of the population of mill hands is much the same as that of the general labourer (see Appendix G).

[illegible]

Their opinions were formed after closely examining and ascertaining the height and weight of 265 male mill operatives. The time at the disposal of the Committee has rendered it quite impossible for an enquiry of this kind. Since 1884 *the number of mills has largely increased*, many more operatives are employed and some have been employed for many years. Without facts to support their opinic [illegible] they [illegible] furth[illegible] the Textile Industry wherever situated in India.

"Particulars" of Work and Wages.

The attention of the Committee was called in the early part of their *inquiry to differences between employers and employed which had led to a strike* in one mill. By the operatives—piece-workers—it was asserted that they did not receive the full amount of wages for the work done.

Section 116 of the English Factory Act lays down very precise regulations "for the purpose of enabling each worker who is paid by the piece to compute the total amount of wages payable to him in respect to his work."

In one or two mills vi[illegible] force, but in all others the [illegible] namely, by the weight of [illegible] *width of cloth, reed, numb*[illegible] the case of Drawing, Slubbing, Intermediate and Roving Frame [illegible], per 1,000 lbs. or per hank. Prices varying according to the reed or count, Frame jobbers by the weight.

At the various mills visited and when taking evidence, it appeared that the methods adopted are satisfactory to the workers.

The requirements of section 116 of the English Factory Act are complicated, and it has been found necessary to appoint Special Inspectors known as Inspectors of Particulars to decide upon the very complex questions that arise. Unless [illegible] tor in Indian Mills.

Remarks on proposals for the creation of a new class of workers to be known as Young Persons.

Section 3, paragraph (4), of this reference directs enquiry as to whether as the result of employment as adults of persons between the ages of 12 and 14 years of age, there has been physical deterioration requiring the creation by law of a *Special Class of Workers known as* "Young Persons".

[illegible] children at the age of 12 years *have* [illegible] considerable attention has been paid [illegible] n of the Mills visited, groups of boys [illegible] mpound or in the offices of the mills [illegible] were also visited, the management stating the age of the children as entered on the books of the school register.

By this means it was possible to draw some comparison in the physical condition and development of children alleged to be a certain age on the school books, and those alleged to be of similar age but employed in mills.

The children or young adults were examined in regard to their general physical appearance and it was ascertained whether they had been certified by the Certifying Surgeon for half or for full time. It was constantly noticed that children certified on certain dates as being over 9 years were within a period of about 12 months certified as being above 14 years. It is not suggested that the conclusions arrived at by the Surgeon were inaccurate, but it is suggested that the latitude and elasticity in this method of certifying children is very wide. It is thought that better results would be obtained were the approximate age stated, as is done in many parts of India.

Employment of children on full time before they have attained the age of fourteen years.

The impression formed on the minds of the Committee was that a large number of children are employed as adults long before they have attained the age of 14 years; many by being put to work without any certificate stating that they are above 14 years, others by misrepresentation or personation have obtained certificates. This is in many instances rendered possible by the fact that the children are sent to certain places away from the Mill for examination. It is said that an official from the mill accompanies them, but this is not always done and sometimes the so called official is the person who has often with difficulty to obtain juvenile labour. It was felt that opinions on this question would be of much greater value could they be supported by direct evidence. In Bombay for 6 years special attention has been given to the birth registration of various class of labourers and thanks to the assistance rendered by the Officers of the Health Department, the names of over two hundred juvenile mill workers were taken and diligent search at considerable trouble was made in the records; in ten cases only however could the definite age be established.

In the opinion of the Committee persons who have been illegally employed have worked beyond their strength and their growth and development has consequently been stunted.

Whether a special class of workers to be known as "young persons" should be created, has been considered from many points of view. Many and experienced witnesses have been examined, the practically unanimous opinion being that, recognizing the difficulty of classification in regard to the age of mill workers, the creation of such a class would cause serious, if not insuperable, administrative difficulties. By some however it has been urged that these administrative difficulties would cease were a class of young persons created whose hours of work should be restricted up to the age of 18 years. It has further been suggested that, if the work of persons under the age of 18 years was restricted by law, in practice, that of male adults would be automatically restricted, as when the young persons left the mill it would not pay to run the Machinery, and that thus the alleged overwork of male adults would be stopped.

It is however feared that in busy times, adults might be employed during the night and furthermore that adults who have worked a whole day would frequently work all night in another mill in which wages are paid daily thus securing money for immediate wants, and that these men would absent themselves from work during the succeeding day or days.

After much thought the conclusions arrived at by the Committee are that the creation of a separate class of young persons would create serious administrative difficulties without attaining the object suggested in the reference. They prefer to place restrictions—within reasonable limits—on adult male labour and to allow all adult males to work the full time allowed by law. It should perhaps be here explained that in making a suggestion that there should be a physical examination prior to employment on full time, that the Committee recommends that all persons under the age of 16 years should be registered. By this it is not in any way intended that the hours of work should be restricted or they should be classed as "young persons", the object in view being to secure that

all persons who are of the approximate age of 14 years should be examined and certified as physically fit. Recognizing the difficulty in regard to precisely stating age this limit has been suggested.

Sanitation.

Under this general heading many and [illegible] be dealt with in detail. On the general qu[illegible] it is satisfactory to report that on some po[illegible] given by Mill Owners and with very good [illegible] to say that certain mills seen by the Com[illegible] desired, some (it would perhaps be invidious to mention them by name) are not only a credit to India but compare very favourably indeed with the best mills to be found in any part of the world.

Unhappily these remarks are not of universal application. In many mills there is room for much improvement and it is believed that there will be no unwillingness on the part of owners and occupiers to carry out improvements if any suggestions of a practical kind are made.

Ventilation and Humidity.

Questions relating to Ventilation, Temperature and Humidity must be closely allied. For manufacturing purposes it is an absolute necessity that temperature and humidity should by artificial means be capable of regulation. If there is too much moisture in the atmosphere as is often the case in the monsoon or wet weather various processes could not be carried out without hot radiating pipes or other appliances for drying the air. At times Humidity is wanting in the atmosphere and it must be artifically supplied.

In the early days of Spinning and Weaving in Bombay, there is evidence to show that when Humidity was wanted all windows were closed, water thrown about on the floor and damp cloths hung up. In a short time owing to carbonic acid and organic impurities given off from the respiratory organs and bodies of the workers and other sources, the air became extremely impure and unhealthy.

Now, in many mills much better methods are found; humidity is supplied by various systems either in the shape of steam introduced by steam jets, cold water in the form of spray, or carried in air currents, by different devices.

In English and Continental Factories the method of humidifying by steam is in common use. It may in certain parts of India where there are cool winters be necessary, but in the opinion of the Committee the cold water system is generally preferable as it reduces the temperature in the rooms and not only moisture but fresh air can be conveyed and equally distributed in the same channels. By this means the temperature in many instances has been found to be much below the outside temperature, the air equally pure.

References to the "Haldane" Committee on Ventilation.

In the report of the Departmental Committee appointed to enquire into the Ventilation of Factories and Workhops, generally known as the "Haldane Committee", 1902, it is pointed out that the existence of a certain cubic air space per person affords no reliable guarantee of efficient Ventilation, that the most highly vitiated air met with by the Committee was in rooms with an air-space of about 10,000 cubic feet per person or 40 times the legal minimum. The report states, that it has long been recognized that the best objective criterion of the sufficiency of Ventilation in ordinary rooms is the proportion of carbonic dioxide in the air. The Haldane Committee recommended that a standard of Ventilation should be prescribed for all classes of Factories. The advantages of laying down such a standard are numerous. The manufacturer or mill-owner is not restricted to this method or to that, he may choose his own, provided always that the standard is maintained. To maintain a reasonable standard the air in the room must be frequently changed. It is possible to regulate temperature by passing incoming air, if warmth is

required through radiators, but in India the cases where this is wanted would be extremely rare. The limit originally proposed by Pettenkofer was 10 volumes of carbonic dioxide per 10,000 volumes of air or 6 volumes in excess of the proportion commonly found in the air of towns.

Legal standard of ventilation in English Humid Cotton Cloth Factories.

By an English Home Office order dated 2nd February 1898 it is laid down that in a Cotton Cloth Factory in which Humidity is produced by artificial means, the Ventilation shall be such that during working hours in no part shall the proportion of carbonic dioxide in the air be greater than 9 volumes of carbonic dioxide in any 10,000 volumes of air. It is now freely admitted by occupiers of Cotton Mills after various tests made officially and unofficially, that this standard can be easily maintained.

In India where there are not the same variations of temperature as in England and where cold draughts are not likely to be introduced into the mills, it is believed by the Committee that a standard could very easily be maintained and, if established, without in any way interfering with production, the health and comfort of the workers would be materially improved. It is by no means suggested that the standard laid down for English works should apply to Indian mills in which conditions are from climatic and other reasons entirely different. It is however suggested that an exhaustive series of air tests should be taken in all parts of India where factories exist, that when results are tabulated, a Sanitary expert in conjunction with mill experts should decide upon and report to Government as to a suitable standard.

When air analyses had to be conducted by the Pettenkofer or similar systems necessitating expensive instruments of a delicate nature and difficult to carry about the suggestion now made would have been of an impracticable character, but by adopting the systems in force throughout the United Kingdom difficulties are removed.

Methods of air analyses.

On the requisition of an Inspector small cases containing 6 or more small stoppered bottles are sent with minute instructions as to how the air to be analysed is to be collected allowing for the breathing of the operatives, or other causes likely to unnaturally vitiate the air at any given points. Samples of air when collected are returned to specially appointed chemists, who for a very small fee analyse the contents of the bottles with the Haldane apparatus. A description of this is given on page 118 of the report of the Ventilating Committee before referred to.

It is not proposed that this apparatus although portable should be taken to the mills. The instrument is a delicate one; vibration in carriages, or more so in railway carriages, rough handling or similar causes would soon put the instrument out of order. The vibration of machinery in the mills, and the alternations of temperature inside and outside causing expansion or contraction of the glass may lead to inaccurate results. By many persons it was asserted, that analyses made in the way now suggested were unreliable.

To set this question at rest, two of His Majesty's Inspectors (expert qualified chemists) Mr. Brothers and Mr. MacNair were directed to make exhaustive comparative investigations both in summer and winter in the mills in Dundee and in Belfast. The samples of air were analysed not only by the Haldane process but also by the Pettenkofer method.

Results of air actually analysed in the mills were also taken and compared with those which were sent to the chemist for analysis in the laboratory. The result of these tests was to establish without doubt, that for all practical purposes the Haldane method of analysing air for carbonic dioxide could be relied upon with the fullest confidence. It is within the knowledge of the President that Mr. Scudder, a very well-known chemist in Manchester, Assistant to Sir Henry Roscoe, also made experiments corroborating the opinion above expressed regarding the efficiency of the Haldane apparatus.

Hygrometers.

It should be required that Wet and Dry Bulb thermometers should be affixed in all mills in which artificial Humidity is used, that records showing the difference in the

readings taken say three times a day should be kept for twelve months, the returns being made monthly to an official deputed to receive them. These should also state the exact nature of work carried on, specifying the counts spun, whether weft or warp, or the class of work in the particular rooms. From these returns it would be very easy to draw up a table which if not enforced by law might nevertheless serve as a useful guide to persons in charge of mills and prevent excessive moisture, sometimes found to the detriment of health and to the discomfort of the worker.

Suggested standard of *purity of water to be used for humidifying.*

In the opinion of the Committee the Medical Inspectors should be required to pay particular attention to the source from which water used for the purpose of humidifying is drawn. The water should be from a public supply of drinking water, or as far as can be ascertained from other reliable source which would stand the test laid down in the English Home Office regulations dated 26th February 1906 for flax spinning and weaving, *viz.*, that any water which absorbs from acid solution of potassium permanganate in 4 hours at 60° F. more than 0.5 grain of oxygen per gallon of water shall be deemed to be liable to cause injury to the health of the persons employed.

Temperature

In another part of this report, attention has been called to the Temperature in Indian Mills at all seasons. In many the state of things is satisfactory, in others excessive temperatures prevail, but if a standard of Ventilation is laid down, in order to maintain this standard, air in the rooms will be changed frequently and as outside air will at all times be introduced the difference between the interior and exterior temperature shoul[illegible] by Plenum [illegible] works seen [illegible] Appendix A, [illegible] outside. In exceptional cases, it may be necessary to resort to mechanical [illegible] *viz.*, the use of *khus khus* [illegible] at any scale of tempe[illegible] [illegible]nt to the effect that a reasonable temperature—bearing in mind what is necessary for manufacturing requirements—should be maintained.

Cleanliness and lime-washing.

In many works visited, the rooms, walls and surroundings were found to be satisfactory, in others, there was ample room for improvement. A reference to the Resolutions and Orders made under section 18, Indian Factories Act, shows that requirements in different parts of India vary In the Resolutions and Orders made by the Bombay Govern[illegible] [illegible] laid down by rule 9 in regard to general cleanliness and [illegible] in 14 months. In Madras rule 7 lays down t[illegible] t in a cleanly and wholesome condition but no rule appears to be made requiring periodical limewashing. In the Punjab the rules do not contain any definite regulation regarding either cleanliness or limewashing. In Bengal rule 10 requires that the Factory shall be kept clean and free from effluvia, and rule 12 lays down that the limewashing shall be done once in two years. In the Central Provinces rule 18 requires that limewashing shall be done when ordered by the Inspector, while rule 20 lays down that the Factory is to be kept in a cleanly state. In the United Provinces rule 24 requires limewashing to be done every 14 months, rule 31 relates to the cleanliness and sanitation of the compound, and rule 25 that the floors are to be swept at least once in every week or oftener, to keep them in a cleanly state.

[illegible] conditions wherever they [illegible] detail, questions relating [illegible] It will be noticed that [illegible] mewashing must be done varies. In some parts no requirement exists at all. The regulations when any have been made also vary It would seem that in this respect all requirements should be assimilated and furthermore that there should be means of knowing

without admissions which could not be used in evidence whether the factories had been lime-washed within the prescribed time. Under the English Factories Act an entry has to be made in the "general register" giving the date of lime-washing and all particulars. Failing such entry, the onus of proof that the law had been observed, rests with the occupier. It may be worthy of consideration whether in India a "general register" containing all legal particulars relating to Factories should not be used, thus avoiding confusion and loss of time which follows when search has to be made through files of loose certificates, loose registers, etc., but if such register is not kept then the declaration suggested above should be made, signed by the occupier, and produced to the Inspector when called for by him.

Dust.

In works visited by the Committee which, will be remembered, were textile factories, no very exceptional dusty processes were noticed. In Carding, Preparing and Spinning rooms a certain amount of dust fibre must be expected and at times this probably causes inconvenience. It would however be difficult to say that injury to health is caused. In cotton, unlike hemp, flax and jute, little dust of a silicious nature attaches itself to the fibre. In Woollen mills the greasy nature of the wool and the numerous processes of washing to which the wool is subject, practically do away with the dust. In jute mills in India material of the best kind is used, "ends," tow, and otherwise dirty materials being exported for use in the manufacture of rope and twine or for other purposes. The Carding of this tow is unquestionably a dusty process injurious to health, but it does not appear to be carried on in India. In the early process of jute manufacture the raw material has to be "batched" either by hand or machinery, frequently by both. Oil and water is sprinkled on the fibre to soften it, moisture naturally confining the dust. Heavily compressed bales are not opened in Indian mills as in those in Dundee, the opening of the bales must be more or less a dusty process, but Indian workers are not subject to this. In cotton mills a machine, or machines known as "Willows" are generally found. Waste material of a very dirty character passes through these machines. Much dust is generated and it is suggested that better means should be adopted for carrying this off by a system of local "exhaust". In a report by the President presented to both Houses of Parliament entitled "Illustration of methods of dust extraction in factories and workshops, 1906," will be found 56 plates with descriptions dealing generally with systems of ventilation and dust extraction. In the early manipulation of jute when the fibre is received into the godown, a process of rough "hackling" takes place. The workers doubtless inhale more dust than is desirable, but taking into consideration the methods under which the work has to be carried on "local exhaust" could only be fixed at an enormous cost, which present circumstances do not appear to call for. It is however suggested that much of this work and also of opening of bales might be done in sheds that are practically open, if not in the open air; that by a system of screens and by placing the workers in suitable positions when there is any wind, the dust may be made to blow away from them. In some workshops visited, the opening was all done in the open air, the management stating that the workers would not work inside.

Should it hereafter be decided that further enquiry relating generally to the conditions of Labour in Indian Factories be made, it is thought that the dust question will call for much more serious attention in many non-textile factories than in the works reported on by the Committee. It was noticed that when occupied in dusty processes the Indian workers almost invariably wore mufflers or in other words a piece of cloth tied in such a way as to cover the mouth and nostrils. In England all efforts have practically failed to induce workers to adopt this precaution.

So far as *Factory* life is concerned in India, special injury to health might probably be looked for in the following industries :—

Diseases of occupation.

Industries.	Diseases.
(1) Brass Foundries	Brass-founders Ague. Dust. Lead-poisoning.
(2) Foundries and Engineering Shops ..	Inhalation of metallic dust in dry grinding processes
(3) Distilleries and Breweries ..	Risk of inhaling dangerous fumes in refrigerating process.
(4) Flour Mills	Inhalation of [illegible]
(5) Leather Works	[illegible]
(6) Aerated and Mineral Water Manufactures	[illegible]
(7) Cement Works	Inhalation of injurious dust.
(8) Coach-building	Risks of Lead-poisoning when old paint is rubbed off.
(9) Cotton Ginning and Cleaning ...	Injurious dust.
(10) Dye Works	Risks of Lead-poisoning where yellow chromate of Lead is used or arsenical poisoning when [illegible]
(11) [illegible] ..	[illegible] ad is used in [illegible]
(12) [illegible]	[illegible]
(13) [illegible] Hides.	[illegible]
(14) Earthenware and Pottery Works .	Inhalation of dust and risk of Lead-poisoning where lead is used.
(15) Lucifer Match Factories .	Phosphorous poisoning.
(16) Paper Mills	Dust during the first process in handling the materials used.

Anthrax.

The special danger in Textile Factories to which attention has been paid by the Committee is the risk of contracting Anthrax by workers in Woollen Mills. In England owing to the many deaths amongst the wool combers and sorters, chiefly in Bradford, very rigid regulations have been laid down for the handling of certain wools Scheduled as "Dangerous Wools". These are "Van Mohair," Persian Locks," "Persian" or so-called Persian (including Karadi and Bagdad) Alpaca, Pelitan "East Indian Cashmere," "Russian Camel Hair," Pekin "Camel Hair" and "All Mohair" other than "Van Mohair". A Home Office order proposes to schedule as "Dangerous" East India wools. The Committee visited numerous Wool sorting godowns in Bombay in addition to Woollen manufactories in different parts of India. In the sorting godowns they found women, young persons and quite young children at work—Babies were often found with their mothers. The occupiers of these godowns say that no cases of Anthrax have ever occurred. It is however possible that there may have been cases which have not been recognized owing to medical advice not having been sought. Samples of dust were collected from several of the godowns, one portion being analysed at the Bombay Municipal Laboratory, the other portion forwarded to the Home Office, London, with the suggestion that some light might be thrown on the general question, were the dust analysed by the Special Bacteriologist at present investigating all questions relating to Dangerous Wools in Bradford The result of the analysis in Bombay did not disclose the presence of the Anthrax Bacillus or the Spore.

The results from Bradford have not yet been received.

In the very extensive wool works known as the Cawnpore Woollen Mills in which 1,700 people are employed, Anthrax up to the present is unknown. It came to the notice of the Committee that there had been an outbreak in the Bareilly Central Jail. The annual report of the Imperial Bacteriologist [illegible]

Superintendent was, that the serum treatment had not been utilized earlier, and suggestions are made that a certain quantity of Anthrax serum of high potency in sealed tubes should be placed in all jails in which foreign or home wool or goat hair is utilized in the manufacture of jail products. Enquiry made by the Committee has since elicited the fact that the wools manufactured at the time were Tibetan, and that during the years 1896 and 1905 inclusive there were nine cases with five deaths in Indian Jails.

Facilities for taking food.

In certain works visited, covered sheds were provided in which the workers could take their food, but generally it was noticed that the operatives prefer to select some corner of the compound where families or persons of the same caste or sect could eat together. Many workers take their meals in the work-rooms. Whether to provide separate accommodation or not depends a good deal on considerations of the habits of the people in different parts of the country, and the systems under which work is carried on. In the opinion of the Committee, whether to make special provision or not is best left to the discretion of individual employers.

Water-supply.

The rules framed by different Local Governments in regard to the supply of potable water and water for washing purposes vary only in unimportant detail. At certain works visited at Delhi it was stated that exception had been taken to the water-supply by the Medical Inspector. By his order a well had been closed. In one mill at Delhi there had been last year a serious outbreak of cholera in which there were 6 deaths in 36 hours and 9 deaths in all. It is of course impossible to say that the water-supply had anything to do with this outbreak.

In works visited in other parts of India little, if any, exception could be taken to the arrangements for supplying water. In many special attention had been given to this question.

Latrine accommodation.

Under the regulations framed by different Local Governments it is laid down, except in those framed by the Central Provinces Administration, that there shall be separate and distinct latrine accommodation for Mills and Factories; that seats shall be provided in the proportion of 1 to every 50 workers. In the Central Provinces the rule requires that there shall be seats in the proportion of 1 to every 25 males. In the majority of the mills visited much attention had been paid to sanitary questions with very good results. In many installations on the septic tanks system were found, in others they were in course of construction. The water carriage system had in many works been very successfully adopted or where hand carriage was necessary suitable arrangements were made for removal. In other mills however things were not satisfactory; separate urinal accommodation was either not provided, or inadequate, and in some sufficient attention was not paid to cleanliness and frequency of removal.

In walking through the compounds the Committee noticed large numbers of persons awaiting admission to the latrines—a fact that indicates that the seating accommodation is insufficient. In the interest of the mill-owners, if for no other reason, it is thought that the rules in regard to the numbers of seats should be altered so as to provide more accommodation. By so doing much discomfort to the workers would be avoided and one of many excuses made for loitering removed.

Means of Escape in case of Fire.

In the Textile Mills visited the arrangements made for the escape of workers in case of fire were good. It is however suggested that the owner should see that doors are hung in such a way that they can be immediately opened from inside and be constructed so as to open outwards.

Fires in Cotton Presses.

At a very late stage in their proceedings, and when their report was nearly complete, it was for the first time brought to the notice of the Committee that grave dangers from fire exist in Cotton Presses, that very many women and some men have been burnt to death.

These presses are found in all parts of India; time does not allow the Committee to make personal enquiry. It is suggested that reports be called for

from the Chief Factory Inspectors in all *Presidencies regarding the frequency* of such fires, the number of casualties for a given period, what precautionary measures can be suggested, whether it is the custom to employ women in front of the openers, and if so, should such *practice* be *prohibited* by law.

A copy of a report on this subject from Mr. W. L. Hartley, then Presidency Inspector, Bombay, *will be found in Appendix F but it is not thought desirable* to publish the name of the firm referred to.

Machinery.

By instructions contained in a letter from the Government of India, Department [illegible] December 1906, it [illegible] ma [illegible]

[illegible] —(Machine shops, Foundries, [illegible] ork, &c.) pertaining to these factories were also seen.

These visits enabled the Committee to form some opinion in regard to the state of similar works outside Textile Mill premises. At the Home Office, London, and in all district offices in the United Kingdom, a book known as a "Guard Book" is kept. [illegible] of plans, drawings and descriptions of appliance [illegible] health considerations The book has been kep [illegible] und recommendations from recognized [illegible]

In Indian *Textile Factories, speaking generally, the attention paid to fencing* reflects great credit on the management. Many Mill Agents and Managers [illegible] of seeing mills at Home, they visit works where machines are [illegible] *it being that many of the most up to* [illegible] l these appear to be generally asked for when new machines are ordered.

A report by Mr. H S. Richmond, one of His Majesty's Superintending Inspectors of Factories, presented to both Houses of Parliament, 1905, and published by Messrs. Darling & Son, 34, Bacon Street, London, East, price 3/9, gives statistics relating to—

1. All machinery accidents in cotton mills,
2. Accidents in connection with mules,
3. Do. do Looms,
4. Do. do. Carding Engines,
5. Do. do. Speed Frames,
6. Do. do. Scutchers,
7. Do. do. Ring and Throstle Frames,
8. Do. do. Drawing Frames,
9. Do do. Winding Frames and reels,
10. Do. do. Combers and Doublers,
11. Do. do. Plaiting machines,
12. Cotton machinery accidents resulting fatally

Illustrations of the latest and best guards are also given. The Committee [illegible] Factory Inspectors [illegible] and Managers of Mills.

In the body of a report such as this space does not allow detail in regard to the general question of machinery fencing, but the Committee would call attention to certain points apparently not yet fully appreciated.

In India as elsewhere there is nothing more difficult to bring home than [illegible] by day in all countries press [illegible] and killed by being caught [illegible] hat there is no danger.

Line shafting at a reasonable height from the floor is from its position considered safe, *but frequently platforms* are placed just under line and other shafting, the result being that workers are practically invited to approach for

oiling, cleaning, feeling of bearings, putting on belts, etc., a recognized source of danger.

Fencing, owing to the number of drums, is sometimes difficult, but often it would be wise to remove the platform, or if it remains, the shaft itself can often be cased in, at points of danger ; sometimes a rail can be fixed which will afford protection without interference with work.

In ginning mills the condition of the line shaft or second motion, calls for careful attention. Many serious and fatal accidents have occurred in such mills ; the clothing of men and women has been caught ; the victims twisted round by the shaft, mangled and killed. The shaft referred to is in a cellar under the ginning machines. In some the cotton seeds fall in large quantities close to the shaft, in all, some seeds find their way to positions near it. Men and women approach the shaft to remove seeds, to clean, oil or feel bearings, put on belts, etc.

There are in India over a thousand ginning mills, some under the Factories Act, some not. In some visited by the Committee, there was no fencing, in some a rail was fixed, but for protection purposes it was of no more use than the outer wall of the factory. The workers go inside the rail.

In a few the shafting itself was cased in between the drums; this method in the opinion of the Committee, if properly carried out, is the right one. In machine shops it was exceptional to find fenced the bevel wheels of vertical drills, the change wheels of lathes, and on other machines dangerous in taking cogged wheels were often left unfenced.

Circular saws are generally unfenced, contrary to universal custom in the United Kingdom. Sides of saw benches are unfenced rendering workers who remove saw-dust, or stoop to pick up a fallen tool or piece of wood liable to serious injury.

In rope works the "flyers" of the horizontal spinners which revolve at a great speed are unfenced, but makers of these machines are now sending them out properly protected.

The water gauge glasses on boilers are fenced in some works, in some they are not. The glasses occasionally burst, and there is danger of the stokers being cut by fragments of broken glass. A worker in Bombay was recently struck in the eye.

In many rooms, but notably in blow rooms in cotton mills, it was noticed that projecting spindles or ends of shafts driving the beaters of scutchers and similar machines were left unfenced, in some these were covered by a loose cap. This or other form of guard is necessary. Unfenced such spindles are a source of danger.

In weaving sheds shuttle guards were sometimes found, but this practice is not universal. To lay down an absolute law on this subject might sometimes lead to unnecessary trouble and expense. In Jute mills visited, the Committee received assurances, which they accept, that the shuttles do not fly ; in some cotton mills where there are fast running looms it was acknowledged that the shuttles do fly, and in some, the workers had improvised guards by hanging up cloths (wing guards) between the looms.

The danger is greater when "under pick looms" are used.

The Inspectors in doubtful cases might require that a certain number of wooden or metal "wing guards" should be fixed in suitable positions; the indentations, if found, would show that the shuttles do fly.

Electricity for Driving Machinery.

Plant for generating electricity is commonly found in Indian mills; the current being utilised for lighting purposes. In one mill only visited by the Committee was it used for driving machinery. There is reason however to believe that electric power will ere long be extensively substituted for steam. In the

[illegible] the construction of gigantic generating [illegible] force to drive all the mills in Bombay. [illegible] ove elicited the fact that between May 1905 and November 1906 there had been three deaths from electric shock.

[illegible] should be considered if [illegible] de under it, are to be [illegible] t and suggested Special Rules drawn up in conjunction with the highest electrical experts by the Electrical Adviser to the Factory Department, Home Office, London, should be considered.

Suggested amendments to the Indian Factories Act.

A brief summary of the conclusions arrived at by the Committee may be useful for reference.

Firstly attention is called to the Indian Factories Act and it is suggested for consideration whether the clauses referred to could not with advantage be amended.

(Act No. XV of 1881 as modified up to December 1904.)

Section 1.—" It applies to the whole of British India." This being so, would not uniformity and efficiency be better secured if primarily the administration of Factory Laws were placed under the Department of Commerce and Industry, Calcutta, reserving for Local Governments all necessary powers within their own jurisdiction.

Should not all Rules and Orders relating to similar works carried on under similar conditions be the same in all parts of India. Unless for good cause shown to the central authority there is reason for alteration or modification.

Seeing that Native States compete with works under the Indian Factories Act, and that temptations exist for erecting mills in those States and so evade the Factory Laws, should means be considered whereby these Laws could be made to apply to States under British influence.

Section 2.—The risks to life and limb from unfenced machinery are identical in similar works, whether work continues for less than four months in the year or whether it continues for the whole year. These risks are identical in places employing over or under fifty hands. Should not all places as defined by the section come within the Act. (According to " Korrawalla's Textile Year Book," there are in India, including Native States and the Nizam's Territory, 1,109 ginning factories. These contain dangerous machinery. Excessive hours are often worked by women and children, both by day and night.)

Section 5 B.—(Holidays.)—Women have been found at work in a Reeling and Winding room on a Sunday, this day having been declared by the firm to be one of the holidays to be legally observed in compliance with rules and orders of the Bombay Government.

In order to prove an offence, the Inspector would have to show (section 5-B Indian Factories Act—Sub-section (2) (*b*)) that these women had not, and would not have a whole day on one of the three days immediately preceding or succeeding the Sunday.

Proof as to whether a day had been given on one of the three preceding days could only be had by the evidence of the women, who would be most unwilling witnesses. The persons having been found at work would of course be told by the management to take a holiday on one of the three succeeding days.

No protection appears to be given against employment on legal holidays. It is suggested that the law should state that any person found at work on a legal holiday (except persons specially exempted) should be deemed to be employed contrary to law.

Section 15.—A reference to part IX, English Factory Act, 1901, will show that in every instance the "occupier" is held to be the person primarily responsible for offences under the Act. "Occupier" is an undefined term but by section 146 it is laid down that in laying an information "it shall be sufficient to state the ostensible occupier of the factory or workshop, or the title of the firm by which the occupier employing persons in the factory or workshop is usually known."

Section 129 of the English Factory Act, 1901, requires that a "General Register" shall be kept in which prescribed entries must be made. These include the name of the "occupier."

The "penalty" section of the Indian Factories Act imposes penalties on "any person" practically relieving the management from the duty of seeing that the law is observed in their works.

Section 17.—It is true, lays down that any occupier shall be held primarily responsible, but he may discharge himself by proof that the breach was committed by some other person without his knowledge or consent.

Important cases have been lost by responsibility being transferred from one irresponsible person to another—a fact to which attention has been called by officials and by a Magistrate.

Section 141 of the English Factory Act requires that before an occupier can transfer his responsibility he must satisfy the Court

(*a*) that he has used due diligence to enforce the execution of the Act,

(*b*) that the said other person had committed the offence without his knowledge, consent or connivance, or

if at the time an offence is discovered by an Inspector it is made clear

(*a*) that the occupier had used all due diligence,

(*b*) by *what* person the offence was committed,

(*c*) that it was committed without his knowledge, consent or connivance and in contravention of his orders,

then the Inspector shall proceed against the actual offender.

It will be seen that before an occupier can throw off all responsibilities for the conduct of his own works, conditions are laid down.

If the occupier fails to convince the Inspector, then, should proceedings follow, he must convince the Court that he had done his duty and prove by what person the offence was committed.

Section 18.—See remarks under section 1.

Section 20.—See remarks under section 2.

Definite Suggestions made by the Committee.

1. That there may be as little delay as possible in giving effect to proposals in contemplation for improving the homes and home surroundings of Mill hands.

2. That arrangements be made to secure uniformity of administration of the Factory Act throughout India.

3. That the systems of Inspection, the strength and composition of the staff of Inspectors should be considered with a view to securing efficiency.

4. That Medical Inspectors whose whole time should be devoted to their duties under the Factories Act be appointed.

5. That certificates of age and physical fitness for employment be required prior to half-time employment, and prior to employment as an adult.

That these certificates be in the Form suggested in the body of the report and that they be the personal property of the persons to whom they apply.

6. That consideration be given to the suggestion made by many experienced witnesses that elementary teachers to be paid by the millowners should be appointed for instruction of half-time children in suitable places on the mill premises.

7. That clear and definite laws be made, requiring that half-time children shall be employed only in sets—

either on the morning and afternoon set system,

or

the double set system largely adopted in Indian Mills.

That efficient measures be taken to secure that the children work only in their proper sets, and that the prescribed hours of labour are not exceeded.

8. That night work of women be prohibited.

9. That by suitable administrative regulations young children should be prevented from accompanying their parents to rooms in which they incur risk from running machinery or the inhalation of dust or impure vapours.

10. That the period of employment in Indian Factories shall be either between the hours of 5-30 A.M. and 6 P.M., or 6 A.M. and 6-30 P.M.

That the engine shall cease running for half an hour between the hours of noon and 2 P.M.

Provided that in Factories working on the day shift system the period may be between 5 A.M. and 8 P.M., but the actual period of employment for male adults shall never exceed twelve hours in any one day. Where from the nature of the work day and night shifts are necessary the period of employment for adult males shall not exceed twelve hours in any twenty-four.

11. That the names of all persons under the age of 16 years be entered in the prescribed register, but that certificates of age and physical fitness be only required up to the age of fourteen years.

12. That samples of air collected under prescribed conditions be taken in works in all parts of India, with a view to hereafter decide upon a suitable standard of ventilation.

13. That wet and dry bulb thermometers be placed in all humid cotton cloth factories, readings taken at fixed times, and returns forwarded monthly; these returns to be eventually considered with a view to deciding the amount of moisture necessary for manufacturing processes, bearing in mind the health of the operatives.

14. That a standard of purity for water to be used for introducing moisture into the mills and factories be fixed.

15. That the dates of lime-washing be entered in a prescribed register.

16. That particular attention be paid to carrying off dust when generated in quantities likely to cause injury to health.

17. [illegible]
workers [illegible]
framed [illegible]

18. That the latrine accommodation be increased to one seat for every twenty-five persons and that separate urinal accommodation be provided in all mills.

19. That doors in the various rooms be hung in such a way that they can be immediately opened from inside and be constructed so as to open outwards.

(This is recommended as a safety measure in case of fire.)

20. That in certain respects—chiefly in ginning mills—more attention be paid to the fencing of dangerous mill gearing and machinery.

[illegible] their sincere thanks to those [illegible] them in their enquiries. [illegible] Chambers of Commerce.

Trades Associations and others, facilities and courtesies were freely offered. The Special Inspectors of Bombay, Ahmedabad, Calcutta and Madras accompanied the Committee to many of the works visited, and rendered valuable help in their respective districts.

An acknowledgment is due to the Press. Valuable information has been gained by the perusal of articles and notes relating to Factory labour; quotations from the *Pioneer* appear in the body of the report. It is well known that able and exhaustive articles on Mill Labour appeared in the *Times of India*. These much exercised the public mind, and the controversy that followed elicited opinions from many holding divergent views. How far the conclusions of the Committee agree with those of the writer of the *Times of India* articles must be judged by a perusal of this report, but it is thought that a public service was rendered when attention was directed to, and discussion invited on, a question of vital interest to employers and employed.

Instructive articles on ventilation and humidity in mills, which appeared in the Indian Textile Journal, were read with interest by the Committee.

(Signed) HAMILTON P. FREER-SMITH,
President.

(„) J. F. MACLAREN, } Members.
(„) J. A. TURNER, }

Bombay, the 5th April 1907.

APPENDIX A

THERMOMETER AND HYGROMETER READINGS AT CERTAIN MILLS

IN

INDIA AND ENGLAND.

ELGIN MILLS COMPANY CAWNPUR.

Middle Weaving Shed.

Date.	Readings of Thermometers, *in degree Farenheit.*						Remarks.
Year 1906.	Between 7 and 8 a. m.		Between 10 and 11 a. m		Between 3 and 4 p. m.		
Month and day.	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.	
June ... 1	96	75	102	78	100	76	
2	94	76	100	74	102	75	
3			Sunday.				
4	94	74	100	75	104	75	
5	98	72	104	76	105	76	
6	98	76	102	75	103	78	
7	98	80	101	82	104	81	
8	97	82	102	85	104	83	
9	95	81	102	83	105	82	
10			Sunday.				
11	97	82	103	84	102	80	
12	97	81	102	84	102	86	
13	96	82	102	90	104	92	
14	97	78	102	87	106	94	
15	96	80	103	88	105	96	
16	94	77	102	80	105	82	
17			Sunday.				
18	100	86	101	86	103	86	
19	96	83	100	86	101	86	
20	100	84	99	85	102	88	
21	98	86	101	87	103	88	
22	100	86	101	85	102	88	
23	100	86	102	87	104	90	
24			Sunday.				
25	100	86	101	87	103	89	
26	100	86	101	87	102	87	
27	98	87	100	87	101	87	
28	97	85	98	86	100	86	
29	98	86	102	87	104	89	
30	100	98	102	88	104	90	
July ... 1			Sunday.				
2	99	86	101	88	104	90	
3	100	87	102	88	103	90	
4	101	88	102	89	104	90	
5	100	88	102	90	104	90	
6	100	87	102	88	103	90	
7	100	88	104	91	104	90	
8			Sunday.				
9	99	87	102	90	103	92	
10	100	91	103	91	104	92	
11	100	91	101	91	102	92	
12	99	83	101	84	102	85	
13	100	91	101	84	102	85	
14	99	83	101	84	102	85	
15			Sunday.				
16	99	87	101	89	102	91	
17	99	84	101	88	101	92	
18	101	83	103	86	103	88	
19	102	86	103	86	103	84	
20	100	85	102	86	104	88	
21	100	88	103	89	104	88	
22			Sunday.				
23	96	85	100	87	104	89	
24	98	86	100	86	102	86	
25	99	87	101	89	102	90	
26	100	90	101	91	Mill closed holiday.		
27	98	90	99	91	104	91	
28	98	90	100	92	103	92	
29			Sunday.				
30	98	90	100	92	100	91	
31	99	92	100	92	101	92	

Records from June 1906 to February 1907 except October which is mislaid.

Date	Readings of Thermometers, *in degrees Farenheit.*						
Year 1906.	Between 7 and 8 a. m.		Between 10 and 11 a. m.		Between 3 and 4 p m.		Remarks.
Month and day.	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.	
August ... 1	98	90	99	91	102	92	
2	100	89	101	89	104	90	
3	101	90	101	91	104	92	
4	100	90	101	90	103	91	
5			Sunday.				
6	99	90	100	90	102	91	
7	98	91	100	92	103	92	
8	99	90	101	91	102	92	
9	101	91	102	92	103	93	
10	99	90	102	92	103	93	
11	100	90	103	92	103	92	
12			Sunday.				
13	97	90	98	90	101	90	
14	97	89	99	90	100	90	
15	96	90	98	90	99	91	
16	99	90	100	90	102	90	
17	98	91	100	91	101	91	
18	99	90	100	90	100	90	
19			Sunday.				
20	97	90	98	89	99	90	
21	98	90	99	90	102	91	
22	98	89	99	90	100	92	
23	99	89	100	90	101	92	
24	99	89	101	91	102	92	
25	98	89	99	90	101	91	
26			Sunday.				
27			Holiday.				
28	98	88	99	89	100	90	
29	98	87	99	88	101	90	
30			No Record.				
31			No Record				
September ... 1	97	89	100	90	101	91	
2			Sunday.				
3	96	88	99	89	101	92	
4	98	89	100	90	102	91	
5	101	92	102	92	101	91	
6	100	90	102	92	102	92	
7	101	91	102	92	103	92	
8	100	91	102	92	103	94	
9			Sunday				
10	100	92	102	93	102	94	
11	101	92	102	93	102	93	
12	102	91	102	92	102	92	
13	100	89	101	90	103	91	
14	101	88	102	93	101	90	
15	100	89	101	90	102	88	
16			Sunday.				
17	98	86	101	89	101	90	
18	99	88	100	88	102	90	
19	97	90	98	91	100	90	
20	99	89	100	90	102	91	
21	99	89	101	92	103	92	
22	97	89	100	90	101	92	
23			Sunday.				
24	96	84	98	88	100	90	
25	97	88	99	89	101	91	
26			Holiday.				
27			Holiday.				
28	96	87	98	84	100	90	
29	98	88	100	90	102	91	
30	98	85	101	92	102	92	

Records for October 1906 mislaid.

Date.	Readings of Thermometers, *in degrees Farenheit.*						Remarks.
Year 1906.	Between 7 and 8 a. m.		Between 10 and 11 a. m.		Between 3 and 4 p. m.		
Month and day.	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.	
November ... 1			Holi	day.			
2	79	76	86	84	88	82	90 per cent.
3	82	79	87	85	89	83	90 ,,
4			Sun	day.			
5	80	77	85	79	88	84	72 per cent.
6	84	80	86	82	88	83	80 ,,
7	79	75	85	82	88	85	85 ,,
8	79	74	84	81	89	84	85 ,,
9	80	77	83	78	87	79	76 ,,
10	79	77	85	82	88	80	85 ,,
11			Sun	day.			
12	76	73	83	78	88	83	76 per cent
13	78	75	84	79	88	84	76 ,,
14	75	70	83	78	88	84	76 ,,
15	76	73	80	78	87	83	90 ,,
16	80	78	85	82	87	84	85 ,,
17	84	81	83	78	88	84	76 ,,
18			Sun	day.			
19	79	77	82	80	87	83	90 per cent.
20	78	76	82	78	87	84	80 ,,
21	78	75	82	79	87	83	85 ,,
22	78	74	82	79	85	81	85 ,,
23	78	74	82	78	84	78	80 ,,
24	77	73	81	77	84	78	80 ,,
25			Sun	day.			
26	75	70	80	76	84	78	80 per cent.
27	76	73	81	75	83	75	72 ,,
28	74	70	80	72	83	73	63 ,,
29	74	68	80	72	84	74	63 ,,
30	74	69	81	75	84	75	72 ,,
December ... 1	75	70	79	75	84	78	80 per cent.
2			Sun	day.			
3	73	70	78	74	85	80	80 per cent.
4	73	70	78	73	84	79	75 ,,
5	75	71	78	75	85	80	84 ,,
6	75	70	81	77	85	80	80 ,,
7	75	71	82	76	84	80	72 ,,
8	75	70	83	77	84	79	72 ,,
9			Sun	day.			
10	70	67	75	71	84	78½	79 per cent.
11	71	68	75	71	82	77	79 ,,
12	73	69	78	73	83	78	75 ,,
13	74	69½	80	75	83	78	75 ,,
14	74	70	81	75	83	78	75 ,,
15	74	70	78	73	80	75	75 ,,
16			Sun	day.			
17	71	68	75	69	78	72	70 per cent.
18	72	68	77	70	82	74	67 ,,
19	72	67	76	72	84	78	79 ,,
20	72	70	76	72	83	80	79 ,,
21	74	71	78	75	82	78	84 ,,
22	74	70	77	73	80	75	79 ,,
23			Sun	day.			
24	66	62	71	68	77	72	83 per cent.
25							
26	65	61	70	67	75	70	85 ,,
27	64	62	72	68	78	74	79 ,,
28	65	61	72	69	77	72	84 ,,
29	66	62	72	69	78	75	84 ,,
30	64	62	73	70	78	75	84 ,,
31	67	64	74	73	80	77	94 ,,

Date.	Readings of Thermometers, *in degrees Farenheit.*						Remarks.
Year 1907.	Between 7 and 8 a. m.		Between 10 and 11 a. m.		Between 3 and 4 p. m.		
Month and day.	Dry Bulb.	Wet Bulb	Dry Bulb	Wet Bulb.	Dry Bulb.	Wet Bulb.	
January ... 1							
2	65	66	74	72	80	78	89 per cent.
3	69	66	75	71	80	77	79 „
4	69	67	74	71½	79	75	84 „
5	70	67½	76	73	79	75	84 „
6			Sunday.				
7	69	67	77½	76	82	80	94 per cent.
8	72	70	76	73	81	78	84 „
9	75	73	77	74	81	78	84 „
10	72	69	76	73	77	74	84 „
11	71	69	74	72	77	73	89 „
12	68	65	72	69	76	72	84 „
13			Sunday.				
14	67	64	73	71	75	71	89 per cent.
15	65	62	72	68½	78	75	79 „
16	67	65	71	69	78	74	88 „
17	67	64	72	70	78	73	88 „
18	68	66	72	69	78	75	84 „
19	67½	65½	73	70	78	75	84 „
20			Sunday.				
21	67	63	74	71	80	76½	84 per cent.
22	67	65	72	68	80	77	79 „
23	70	67	75	72	82	75	84 „
24	73	69	77	71½	85	79½	75 „
25	74	70	80	76	85	81	80 „
26	75	72½	80	76	85	80	80 „
27			Sunday.				
28	70	64	78	72	83	78	71 per cent.
29	74	71	80	78	84	78½	90 „
30	75½	72	79½	75	84	80	80 „
31	74	70	77	73	83	79	79 „
							Moisture.
February ... 1	70	67	76	73	79	74	84 per cent.
2							
3			Sunday.				
4	72	69	77	75½	81	78	89 per cent.
5	75	73	78	75	83	78	84 „
6	70	66	75	71	76	71½	79 „
7	73	70	77	74	79	76	84 „
8	68	66	73	69	76	71	79 „
9	69	67	73	70	76	70	84 „
10			Sunday.				
11	72	70	76	73	80	76	84 per cent.
12	74	70	75	70	76	70	74 „
13	69	64	71	68	78	75	83 „
14	70	67½	72	68	78	76	79 „
15	73	70	76	73	83	78	84 „
16	74	72	77	74	82	78	84 „
17			Sunday.				
18	73	70	74	70	77	74	79 per cent.
19	73	72	74	72	76	73	89 „
20	69	69	73	70	77	75	84 „
21	70	68	74	71	78	75	84 „
22	69	67	75	72	80	76	84 „
23	71	68	79	75	79	75	80 „
24			Sunday.				
25	70	65	75	69	80	72	71 per cent.
26	72	68					Note.—Percentage of moisture taken off the 10, 11 a. m. particulars.
27							
28							

W. VERNON,
Manager.

EMPRESS MILLS, NAGPUR.

D = Dry.
W = Wet.
H = Humidity.

March 1906.

Date.	Nagpur observatory reading.						New Spinning Mills.																	
							Card Room.									Spinning Room.								
	10 A. M.			4 P. M.			6-30 A. M.			12 NOON.			5 P. M.			6-30 A. M.			12 NOON.			5 P. M.		
	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.
			%			%			%			%			%			%			%			%
1	73·1	53·5	17	85·9	58·0	9	66	60	71	69	62	67	71	65	72	70	61	60	76	68	66	80	71	64
2	78·9	57·0	18	92·2	64·6	17	67	62	76	72	68	82	75	61	44	74	64	58	82	71	58	86	74	57
3	79·9	59·5	22	93·9	67·1	19	67	62	76	70	65	77	74	69	78	74	64	58	80	69	57	84	72	55
4	86·9	62·1	17	95·8	67·1	16	70	61	60	70	62	64	71	65	72	70	60	55	78	68	60	81	70	55
5	78·0	67·8	54	96·4	67·1	15	77	71	74	81	75	76	..	...	...	70	62	64	79	67	53	...	...	...
6	88·4	63·1	18	97·4	65·6	13					Moharram		Holiday.											
7	87·9	66·1	26	97·1	66·6	14	74	65	62	80	72	68	79	73	75	78	66	53	88	74	52	90	75	50
8	81·9	58·0	15	92·9	62·1	9	70	65	77	74	65	62	76	68	66	78	65	53	88	74	52	90	75	50
9	82·9	59·0	16	82·9	65·1	10	71	65	72	76	68	66	77	70	71	80	66	47	83	70	52	86	72	51
10	85·4	62·6	22	98·1	69·1	17	72	66	73	79	70	64	...	...	...	80	68	54	84	74	63	88	75	55
11	91·6	67·8	24	99·1	68·6	15						Holi	Holiday.											
12	83 9	61·1	28	94·6	67·1	18	76	70	74	78	70	67	80	72	68	80	66	47	86	76	63	...	...	...
13	84·9	61·5	19	94·9	65·6	15	72	63	61	78	70	67	81	72	65	80	68	54	86	72	51	88	73	49
14	81·9	62·1	26	94·9	67·1	17	72	67	77	78	70	67	89	73	72	75	63	51	88	71	43	90	74	47
15	85·1	66·6	34	91·6	70·1	30	73	68	76	79	73	75	80	75	79	76	64	52	...	...	...	...	...	...
16	83·4	70·1	48	86·4	71 1	41	74	71	86	81	76	80	83	78	80	...	...	...	...	...	...	...	...	...
17	81·6	70·1	54	89·4	71·1	37	74	69	78	81	75	76	86	78	70	...	...	...	87	74	54	90	76	53
18	76·9	66·6	55	87·9	67·1	29					Sunday		Holiday.											
19	83·9	64·1	28	90·8	64·1	16	70	66	81	76	70	74	80	72	68	74	66	66	88	68	35	90	68	32
20	83·9	62·6	25	94·1	67·6	23	74	68	74	80	71	64	83	75	69	71	64	68	82	70	55	95	72	32
21	75·9	66·1	56	74·9	68·1	68	79	70	64	84	75	66	85	77	70	78	68	60	85	73	56	82	72	62
22	75·9	69·1	69	83·4	72·1	55	77	73	45	83	76	73	89	79	61	78	73	79	82	73	65	90	70	35
23	82·9	67·6	41	93·4	69·1	21	81	75	76	88	75	55	88	77	61	79	70	64	90	72	41	96	74	36
24	87·4	69·3	36	95·4	68·6	21	84	76	69	87	77	64	92	78	54	80	70	61	92	74	43	98	74	32
25	86·9	69·1	36	97·9	71·1	22					Sunday		Holiday.											
26	90 9	70·1	31	96·9	71·6	25	79	74	79	83	75	69	84	78	77	82	70	55	94	76	44	97	78	43
27	84·4	70·6	47	94·9	72·6	30	79	74	79	86	82	81	88	85	81	84	74	58	92	78	54	92	80	59
28	88·4	71·6	41	99 9	71·1	19	79	75	83	85	79	77	86	79	73	86	73	54	92	78	54	94	78	49
29	89·9	72·1	38	98·4	73·6	27	82	74	69	83	78	80	85	79	77	86	74	57	92	78	54	93	79	54
30	89 9	69·1	30	100·3	71·1	24	77	71	74	84	77	73	87	79	70	84	70	49	93	76	57	96	78	45
31	89·9	69·6	32	102·0	68·3	11	82	72	62	80	75	79	85	77	70	86	74	57	90	77	56	92	75	45

April 1906.

Date.	Observatory reading.						New Spinning Mills.																	
							Card Room.									Spinning Room.								
	10 A.M.			4 P.M.			6 30 A.M.			12 NOON.			5 P.M.			6 30 A.M.			12 NOON.			5 P.M.		
	D.	W.	H.	D.	W.	H.	D	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W	H.
			%			%			%			%			%			%			%			%
1 ...	87·9	62·0	16	97·9	61		81	60	54	80	73	72	84	77	73	86	63	30	90	72	41	94	74	3[illegible]
2 ...	87·9	64·1	21	96·9	66·6	10	74	70	82	79	72	71	83	76	73	82	65	42	86	72	51	88	74	32
3 ...	91·4	64·6	17	101·0	68·1	12								Holiday.										
4 .	92·3	71·6	32	102·2	70·	16	74	69	78	83	77	76	85	79	77	78	66	63	92	76	48	92	78	54
5 ..	95·9	66·8	15	104·0	69·1	12	76	72	52	82	74	60	85	77	70	84	70	40	90	76	53	90	76	53
6 ...	96·4	67·9	34	104·6	70·3	13	75	72	87	84	77	73	85	78	73	86	72	51	90	76	53	90	75	51
7 ...	99·1	68·3	14	107·3	70·5	10	81	66	44	84	76	69	87	78	67	90	74	47	90	76	63	92	76	48
8 ...	101·8	68·3	11	109·2	70·7	9								Sunday										
9 .	61·0	69·6	15	106·2	70·2	11	79	72	71	90	79	62	86	77	67	88	70	40	102	75	28	92	78	54
10 ...	99·9	69·1	15	107·9	71·1	12	79	73	75	84	75	66	85	77	70	88	74	82	90	76	53	92	79	55
11 ...	101·1	69·5	15	108·0	75·3	17	80	73	72	88	77	61	88	79	67	88	74	52	95	74	37	92	80	59
12 ...	98·4	67·0	13	106·5	71·1	12	82	74	69	85	77	70	85	76	66	88	74	52	90	76	63	91	76	54
13 ...	96·4	65·1	11	107·5	70·6	11	75	69	74	79	72	71	83	76	73	84	70	49	89	76	59	90	75	59
14 ...	96·4	66·6	15	107·0	69·6	10	75	69	74	79	71	68	80	74	75	84	71	53	88	75	56	90	77	56
15 ...	99·9	64·6	7	108·7	68·1	5								Sunday.										
16 ...	99·9	68·1	13	103·9	72·1	11	74	64	58	87	79	67	88	82	77	92	70	30	93	79	43	93	80	57
17 ...	101·0	69·8	16	109·0	72·1	11	77	73	78	80	74	73	86	76	63	88	74	52	91	77	63	94	79	52
18 ...	98·0	67·6	14	106·0	70·6	12	78	73	79	83	72	50	82	75	72	80	70	61	90	74	47	91	76	53
19 ..	101·0	68·1	12	107·7	71·6	12	73	67	66	84	70	49	83	76	73	84	72	56	91	72	34	92	73	54
20 ...	101·2	71·1	18	105·0	74·1	16	79	70	61	86	74	57	86	79	83	86	74	67	94	75	41	94	80	51
21 ...	102·0	71·1	17	105·0	73·1	14	80	73	72	87	71	45	87	76	60	83	75	55	93	76	40	94	79	52
22 ...	99·0	69·3	16	107·0	73·1	15								Sunday.										
23 ...	99·9	71·1	19	106·5	76·1	19	78	73	79	88	70	40	86	79	73	89	75	65	98	77	43	93	79	52
24 ...	101·5	73·6	23	100·7	77·6	20	79	73	75	84	77	73	87	81	77	80	76	63	90	76	53	93	77	45
25 ...	102·0	68·1	11	109·0	72·6	13	80	75	79	85	76	66	87	80	74	86	76	63	97	77	40	93	80	57
26 ...	102·5	68·6	10	109·0	71·1	10								Holiday										
27 ...	102·1	69·1	13	100·5	71·1	12	77	72	78	81	76	69	85	77	70	90	76	53	92	72	56	94	80	54
28 ..	102·0	69·1	13	108·6	73·1	13	78	72	75	80	71	41	86	78	70	90	76	43	90	81	65	95	80	52
29 ...	104·0	71·1	15	110·0	73·1	13	80	74	75	84	74	63	86	79	70	85	71	50	94	74	59	95	79	47
30 ...	105·0	71·1	14	110·5	72·1	10	80	73	72	84	78	77	86	78	70	90	76	53	95	78	47	99	80	52

May 1906.

Date.	Observatory reading. 10 A.M. D.	W.	H. %	4 P.M. D.	W.	H. %	New Spinning Mills. Card Room. 6-30 A.M. D.	W.	H. %	12 NOON. D.	W.	H. %	5 P.M. D.	W.	H. %	Spinning Room. 6-30 A.M. D.	W.	H. %	12 NOON. D.	W.	H. %	5 P.M. D.	W.	H. %
1 ...	104·0	70·1	13	111·0	74·1	13	81	76	81	87	75	57	86	80	77	90	74	47	97	76	38	95	81	55
2 ...	104·8	71·9	15	110·0	72·6	10	83	77	76	87	78	67	87	80	74	92	78	54	96	78	45	95	80	52
3 ...	103·5	68·1	10	109·5	74·6	15	88	77	61	81	76	80	85	79	77	90	78	59	92	78	54	94	80	54
4 ...	103·5	70·6	15	111·0	72·1	10	85	75	63	85	85	63	86	76	63	94	84	66	94	77	46	98	79	43
5 ...	103·5	70·6	15	112·0	72·6	10	79	73	75	84	75	66	84	77	73	90	76	53	94	79	52	94	80	54
6 ...	107·0	69·6	10	113·5	71·1	6									Sunday.									
7 ...	107·0	70·1	10	114·5	73·6	9	83	76	73	86	78	70	88	81	74	90	76	53	94	78	49	96	80	50
8 ...	104·5	73·1	18	105·5	72·6	16	81	76	81	89	76	55	86	79	73	91	76	50	91	78	56	98	80	46
9 ...	102·0	77·1	29	102·0	74·1	23	83	78	80	89	81	71	89	79	64	94	80	54	98	82	51	98	80	46
10 ...	99·9	74·1	25	94·6	75·1	37	79	75	83	86	78	70	85	78	73	92	78	54	96	80	50	98	80	46
11 ...	97·9	75·1	31	111·0	75·1	14	77	77	95	87	80	74	86	80	77	90	78	59	96	80	50	98	79	43
12 ...	102·5	73·1	20	112·0	70·6	7	76	76	63	87	78	67	86	79	73	90	76	53	98	79	43	97	78	48
13 ...	105·5	71·1	13	112·0	72·1	9									Sunday.									
14 ...	105·5	78·6	18	111·5	71·6	9	81	77	84	95	74	37	88	82	77	92	82	65	105	75	24	99	78	39
15 ...	105·0	71·1	14	111·0	74·1	13	81	78	88	89	78	61	88	80	71	94	74	66	99	78	39	99	78	39
16 ...	103·0	71·1	16	108·0	71·1	11	78	78	96	89	76	55	87	80	74	92	78	54	100	78	37	98	78	41
17 ...	101·0	74·6	24	109·5	78·1	13	78	77	96	89	81	71	85	81	84	92	74	43	98	78	41	98	78	41
18 ...	103·5	74·1	21	108·0	74·1	16	83	78	80	87	81	77	87	82	81	92	76	48	96	78	45	98	78	41
19 ...	102·5	75·6	21	109·0	77·3	20	79	79	96	87	82	81	89	83	78	94	78	40	98	80	46	100	80	42
20 ...	108·0	74·8	21	111·0	76·6	17									Sunday.									
21 ...	64·5	70·6	14	110·0	73·1	12	77	71	74	95	76	42	90	80	65	94	76	44	102	82	42	100	82	47
22 ...	104·0	69·6	13	110·5	72·1	10	77	74	83	88	75	55	89	77	58	92	72	37	94	76	44	98	78	41
23 ...	107·0	74·6	24	110·0	77·1	19	85	75	63	90	81	68	88	82	77	94	78	49	96	80	50	98	80	46
24 ...	104·0	77·1	26	108·2	74·1	16	86	78	70	89	80	68	91	79	59	96	78	45	99	80	44	98	80	46
25 ...	101·0	79·1	35	82·4	74·1	65	78	66	53	89	81	71	86	77	67	92	78	54	97	82	53	94	80	54
26 ...	77·4	76·6	95	85·9	76·1	61	83	77	76	87	80	74	86	79	73	92	78	54	97	81	50	96	80	50
27 ...	99·9	76·1	30	109·5	77·6	20									Sunday.									
28 ...	102·0	76·1	27	111·0	74·1	13	83	76	73	93	76	46	89	79	71	92	82	65	100	79	39	98	80	46
29 ...	103·0	73·6	21	109·0	74·6	16	84	77	73	87	77	64	88	78	64	94	80	54	96	79	47	98	80	46
30 ...	102·0	73·6	22	107·7	76·6	21	83	73	62	85	75	63	86	79	73	90	76	53	94	78	49	94	78	49
31 ...	99·9	76·6	31	105·5	73·1	17	83	77	76	85	79	77	85	76	66	92	78	54	96	80	50	97	78	43

June 1906.

Date.	Observatory reading 10 A. M. D.	10 A. M. W.	10 A. M. H.	4 P. M. D.	4 P. M. W.	4 P. M. H.	New Spinning Mills. Card Room. 6-30 P. M. D.	6-30 P. M. W.	6-30 P. M. H.	12 NOON. D	12 NOON. W	12 NOON. H.	5 P. M. D	5 P. M. W	5 P. M. H	Spinning Room. 6-30 P. M. D.	6-30 P. M. W.	6-30 P. M. H.	12 NOON. D.	12 NOON. W.	12 NOON. H.	5 P. M. D.	5 P. M. W.	5 P. M. H
			%			%			%			%			%			%			%			%
1 ...	98·9	76·1	31	105·5	73·1	17	83	78	80	86	80	77	85	78	73	92	78	54	96	82	55	95	79	40
2 .	92·9	74·1	38	98·4	73·6	27	81	75	76	85	78	73	86	79	73	0	78	59	93	80	57	96	80	50
3 .	102·5	74·1	22	102·5	74·2	22									Sunday									
4 ..	98·9	74·1	27	107·0	76·1	20	83	76	73	93	77	49	87	79	70	92	80	59	101	81	42	98	78	41
5 ...	105·0	78·1	26	102·0	78·1	31	83	77	80	89	80	68	86	80	77	92	80	59	98	81	48	95	80	52
6 ..	96·6	75·8	35	98·9	78·6	33	86	79	73	89	80	69	85	79	77	92	80	50	94	80	51	95	80	52
7 ...	98·4	78·1	37	98·9	76·1	31	82	77	80	90	79	62	87	79	70	92	78	54	98	82	55	96	79	47
8 ...	92·4	77·1	47	104·0	75·1	22	81	77	84	89	78	61	90	78	59	90	80	65	97	81	50	98	83	58
9 ...	97·0	74·8	30	106·0	75·6	21	81	77	84	92	80	59	89	81	71	90	78	59	98	82	51	97	84	58
10 ...	83·6	75·6	68	95·9	75·1	34									Sunday.									
11 ...	95·4	76·3	38	99·9	75·6	29	80	75	70	91	80	62	91	80	62	90	80	65	98	82	51	96	84	61
12 ...	86·9	75·1	55	97·4	77·1	37	82	78	84	87	80	74	89	82	74	90	82	71	94	84	66	94	84	63
13 ..	93·8	74·0	36	95·0	76·1	39	80	76	83	89	83	78	90	84	78	90	82	71	97	86	64	96	86	67
14	91·9	78·1	51	94·9	77·1	42	84	80	84	90	82	71	91	81	65	90	84	78	96	88	73	96	89	76
15 .	87·4	77·6	62	101·0	79·6	37	83	79	84	89	81	71	90	82	72	86	80	77	96	82	55	97	84	58
16 ...	86·9	78·1	65	90·9	77·1	51	80	76	83	89	81	71	91	81	65	90	80	65	96	82	55	98	83	53
17 ...	91·0	78·6	46	106·0	75·6	21									Sunday									
18 ...	95·9	77·1	40	84·4	77·1	79	85	78	73	93	80	57	89	82	74	90	82	84	100	86	57	96	86	67
19 ..	89·9	78·1	56	77·4	75·6	91	86	80	77	87	83	84	86	81	81	90	82	84	94	86	72	92	85	75
20 ...	73·9	73·6	98	76·9	75·1	91	81	78	80	84	79	80	87	79	70	88	80	71	87	82	81	92	84	72
21 ..	80·4	76·1	80	80·4	76·6	83	86	80	77	90	82	71	91	83	71	90	81	75	93	86	75	94	86	72
22 ...	79·9	75·1	78	88·9	78·1	89	86	81	81	92	83	69	93	83	66	90	84	78	94	87	75	98	88	67
23 ...	87·4	78·1	64	92·4	78·6	82	88	81	74	91	84	75	92	83	69	92	84	72	95	87	72	99	85	67
24 ..	80·9	77·1	85	78·4	76·6	91									Sunday.									
25 ...	73·9	73·1	90	72·9	71·6	93	87	80	74	85	76	66	90	80	65	90	86	83	85	82	89	92	86	78
26 ...	82·9	76·1	71	82·0	73·6	69	87	80	74	87	80	74	89	80	71	88	82	77	91	83	71	92	86	78
27 ...	82·9	77·1	75	85·0	78·1	69	88	80	71	88	81	74	90	82	71	92	76	48	92	86	78	92	86	79
28 ...	83·9	77·1	72	82·4	75·8	71	87	80	88	87	82	81	89	80	68	86	82	64	93	86	73	92	86	78
29	82·0	77·1	75	82·7	74·8	80	87	79	70	88	80	71	86	79	73	94	86	72	92	85	75	90	84	78
30 ...	80·9	75·6	77	83·4	77·1	73	88	78	64	88	80	71	86	79	73	88	80	71	87	82	81	89	82	71

July 1906.

Date.	Observatory reading. 10 A. M. D	10 A. M. W.	10 A. M. H.	4 P. M. D.	4 P. M. W.	4 P. M. H.	New Spinning Mills. Card Room. 6-30 A. M. D.	W.	H.	12 NOON. D.	W.	H.	5 P. M. D.	W.	H.	Spinning Room. 6-30 P. M. D.	W.	H.	12 NOON. D.	W.	H.	5 P. M. D.	W.	H.
			%			%			%			%			%			%			%			%
1 ...	81·4	75·6	75	77·4	74·6	86									Holi	day.								
2 ...	83·9	77·1	72	85·4	78·1	70	87	79	70	88	80	71	88	79	67	90	82	71	92	83	69	92	84	72
3 ...	79·9	75·6	80	87·9	79·1	52	78	76	91	84	78	77	89	81	71	86	80	77	90	82	71	96	86	67
4 ...	83·9	78·1	75	91·4	80·1	59	88	84	52	90	83	75	93	84	69	92	84	72	95	86	69	96	86	67
5 ..	78·4	76·6	91	88·9	80·1	66	87	82	81	88	83	81	91	84	75	92	84	72	90	83	75	96	87	70
6 ...	85·9	78·1	68	92·9	79·1	52	84	79	80	90	82	71	94	83	63	90	80	65	94	85	69	98	87	64
7 ...	82·4	77 1	77	88·1	78·6	64	84	79	80	89	84	81	91	83	71	90	86	85	95	88	76	96	90	79
8 ...	79·4	77·6	91	85·7	79·1	72									Sun	day.								
9 ...	78·2	75·2	86	85·8	78·1	68	86	80	77	91	85	78	91	84	75	90	86	85	91	88	89	96	90	79
10 ...	82·9	77·1	78	85·9	78·8	70	78	76	91	90	83	75	92	84	72	90	84	78	93	88	82	94	79	52
11 ...	82·9	78 1	79	88·4	80·1	68	83	78	80	94	87	75	93	85	72	90	86	85	92	88	85	96	90	79
12 ...	84·9	78 1	74	84·5	78·1	74	85	80	80	90	84	78	92	84	72	92	86	78	84	89	80	94	90	54
13 ...	84·4	79·1	77	80·4	78·1	89	86	82	84	91	82	68	93	83	66	90	84	78	88	85	88	98	90	73
14 ...	83·9	78·1	75	78·4	77·1	93	88	86	92	89	83	78	88	81	74	90	86	85	92	88	85	95	89	79
15 ...	81·4	76·1	77	85·9	79·1	72									Sun	day.								
16 ...	84·9	78·1	72	87·4	79·1	67	87	81	77	88	81	74	91	83	71	90	86	85	94	90	86	97	83	56
17 ...	80·9	77·1	83	87·4	79·1	67	84	80	84	89	83	78	92	84	72	88	81	74	94	90	86	96	92	86
18 ...	84·9	79·1	76	88·9	81·6	69	90	83	75	92	86	78	93	86	75	94	80	54	95	82	58	96	93	53
19 ...	86·4	81·6	80	78·9	77·1	91	90	83	75	91	84	75	88	82	77	94	88	79	93	90	89	90	87	88
20 ...	84·6	79·8	79	86·1	80·1	76	88	81	74	90	84	78	93	86	75	92	82	65	94	90	86	95	90	82
21 ...	79·9	76·6	85	79·9	77·6	89	86	80	77	86	81	81	86	81	81	90	80	65	92	80	59	92	82	59
22 ..	76·4	75·1	93	77·4	75·8	91									Sun	day.								
23 ...	77·9	74·6	84	78·9	75·6	85	84	78	80	88	80	71	88	81	74	96	86	67	91	80	62	92	80	59
24 ...	78·4	74·6	82	85·4	76·1	63	88	80	71	89	81	71	89	82	74	88	78	71	92	80	59	93	80	57
25 ...	80·6	75·3	76	83·9	77·1	72	89	80	68	91	83	71	92	84	72	92	80	59	94	80	54	94	82	60
26 ...	81·9	76·6	77	86·9	78·6	67									Holi	day.								
27 ...	80·9	75·1	74	82·2	75·9	73	80	79	96	87	80	74	88	80	71	84	79	80	91	80	62	93	80	57
28 ...	79·8	74·1	74	81·9	76·1	75	88	79	67	87	81	77	90	83	75	92	80	59	90	79	62	92	80	59
29 ...	81·4	75·4	74	77·9	75·6	89	86	79	73	88	81	74	89	82	74	88	78	71	92	80	59	92	80	59
30 ...	81·9	76·6	77	88·8	81·1	69	86	82	84	90	82	71	92	83	69	92	89	89	94	82	60	97	82	53
31 ...	81·9	77·3	79	80·9	78·6	89	91	86	82	91	84	75	91	83	71	94	82	60	96	84	61	92	82	59

August 1906.

Date.		Observatory reading.					New Spinning Mills.																	
							Card Room.									Spinning Room.								
	10 A. M.			4 P. M			6-30 A. M.			12 NOON.			5 P. M			6 30 A. M.			12 NOON.			5 P M		
	D	W.	H.	D.	W.	H	D	W	H	D.	W.	H	D.	W.	H.	D	W.	H.	D	W.	H	D.	W	H
			%			%			%			%			%			%			%			%
1 ...	81 9	77 6	81	87 3	77·3	62	89	81	68	89	83	75	91	82	68	91	80	62	92	82	65	94	83	54
2 ..	84 4	77·1	68	88 4	75 6	53	87	81	77	90	81	68	94	82	60	90	78	59	93	79	57	96	79	47
3 .	82 4	74 6	67	84 9	76 6	66	88	80	71	91	82	68	93	83	66	90	78	59	94	79	52	94	80	54
4 .	83 4	76 6	72	90 4	77 6	54	90	84	78	91	81	65	96	83	58	92	80	59	94	79	52	98	80	46
5 ..	85 9	76·6	65	87 9	77·3	59									Sunday.									
6 .	81 9	75 6	73	77 4	73 6	82	85	82	88	89	81	71	93	82	63	92	80	59	90	80	65	98	80	46
7 .	84 9	77·1	68	88 9	77 1	56	87	80	74	89	81	71	90	81	68	90	80	65	94	80	54	94	80	54
8 .	84·9	76 6	66	89·9	78 1	56	88	80	71	89	81	71	94	83	63	90	78	59	95	80	52	98	80	45
9 ..	85 4	76·1	63	88 4	77 6	59	87	82	81	89	81	71	93	82	63	92	78	84	96	80	50	98	80	46
10 .	80 9	76 8	79	81 6	77 6	82	83	81	92	86	80	77	89	83	78	90	80	65	92	80	59	94	82	60
11 .	84 4	78·6	76	83 9	77 6	74	86	82	84	89	82	74	91	84	75	92	80	65	94	82	60	94	82	60
12	85·9	77 8	67	91 4	78 1	52									Sunday									
13 ..	86 9	77·6	64	90·0	78·1	56	82	79	88	90	81	68	93	82	63	90	78	59	96	80	50	98	80	46
14 ..	85 9	75 1	58	91·4	76 1	48	80	79	96	88	79	67	94	82	60	90	80	65	96	80	50	98	82	51
15 .	80·9	76 3	82	88 5	77·5	59	81	80	84	90	80	65	94	83	63	90	80	65	96	80	50	96	82	55
16 .	85 1	77 3	68	85 9	76·5	64	85	80	80	91	82	68	92	83	69	90	80	65	96	81	53	96	82	55
17 .	79·3	77·0	91	84 9	78 0	72	85	80	80	89	83	73	90	82	71	90	80	65	92	82	65	96	82	55
18	82 9	77 3	73	86 9	78 2	65	87	80	74	88	82	77	90	82	71	90	80	65	92	80	59	94	81	57
19	81·9	77·6	81	81·9	78 1	83	87	82	81	88	81	74	..	..	...	90	80	65	90	80	65	..	...	.
20 ..	82 9	77·1	75	87 9	78 1	65									Holiday									
21 ...	84·4	79·1	77	79 9	77 8	89	80	80	96	88	82	77	88	83	81	89	90	68	93	82	63	93	82	63
22 ...	83·4	77 3	73	90·4	78 6	57	86	81	81	88	82	77	91	83	71	90	80	65	92	81	62	96	82	65
23 ...	82 9	78 6	81	84 9	79 1	76	84	81	88	87	83	84	90	84	78	90	80	65	92	82	65	94	83	63
24 ...	83 9	78·1	75	85·1	78 6	74	88	85	88	89	84	81	89	83	78	92	82	65	94	82	60	90	84	78
25 ..	82 9	78·1	79	82·4	79 1	85	88	83	81	89	84	81	89	83	78	90	80	65	94	83	63	91	81	65
26 ...	78 9	77 1	91	79 9	77·1	87									Sunday									
27 ...	82 4	78 1	81	76 9	76·1	95	83	79	84	87	82	81	85	79	77	86	73	70	92	82	65	90	81	68
28 ..	77·1	74 1	86	75·9	74·6	93	83	78	80	84	78	77	83	82	77	84	78	70	84	79	73	90	84	78
29 ...	72·9	72·1	95	73 9	72 8	93	83	77	77	87	80	74	90	83	75	85	78	73	87	78	67	83	78	64
30	72·9	71 6	93	75 6	72 3	84	80	78	91	82	79	88	83	77	76	85	76	66	86	77	66	88	78	64
31 ..	72·9	70 1	86	74 8	73 6	93	77	75	91	86	80	77	87	80	74	82	72	62	86	76	63	88	78	64

September 1906.

Date.	Observatory reading.						New Spinning Mills.																	
							Card Room.									Spinning Room.								
	10 A. M.			4 P. M.			6-30 A. M.			12 NOON.			5 P. M.			6-30 A. M.			12 NOON.			5 P. M.		
	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.
			%			%			%			%			%			%			%			%
1 ...	80·9	75·3	74	81·9	77·1	79	93	85	72	87	83	84	89	81	71	90	80	65	92	82	65	94	82	60
2 ...	81·4	75·1	73	86·4	77·6	65	Sunday.																	
3 ...	83·0	78·1	75	84·1	79·1	77	80	70	96	85	82	68	88	83	81	88	80	71	91	86	72	94	84	65
4 ...	80·9	77·6	85	85·9	78·6	70	85	80	80	87	83	84	89	81	71	90	80	65	92	82	65	94	82	60
5 ...	82·1	77·1	77	88·4	79·1	64	85	80	80	87	82	81	89	83	78	90	80	65	91	82	72	94	82	60
6 ...	81·4	78·1	85	80·9	78·1	87	88	82	77	89	84	81	90	85	81	90	80	65	92	82	65	92	82	65
7 ...	80·4	76·6	83	79·4	76·6	86	88	82	77	85	83	81	89	82	74	90	80	65	92	81	62	92	80	59
8 ...	81·1	76·1	78	83·1	76·6	73	Holiday.																	
9 ...	81·4	74·1	69	83·9	76·1	68	83	78	80	85	79	77	88	78	64	88	78	64	90	78	59	93	79	54
10 ...	80·0	74·6	73	80·0	74·1	91	81	78	88	83	77	76	85	75	73	88	78	64	90	77	56	90	78	59
11 ...	79·4	74·6	78	82·4	76·1	73	81	79	92	82	79	68	88	80	71	88	78	64	90	76	59	93	80	57
12 ...	81·1	76·1	78	84·9	76·6	66	86	80	77	89	82	74	90	81	65	90	80	65	92	81	62	94	80	54
13 ...	79·4	74·1	76	83·9	75·6	66	83	80	88	83	80	85	89	82	74	90	78	59	91	78	56	93	80	57
14 ...	79·9	74·1	74	80·1	76·3	61	83	81	92	85	81	84	91	82	68	89	78	61	84	79	80	87	81	77
15 ...	78·9	75·6	85	84·9	77·1	68	88	77	61	87	81	77	91	80	62	90	80	65	92	80	69	95	82	53
16 ...	84·9	76·1	64	86·9	77·1	62	85	76	66	88	80	71	91	81	65	86	80	77	94	80	54	97	82	53
17 ...	85·4	76·1	63	89·9	76·3	50	83	76	73	87	78	67	91	79	59	...	...	...	93	79	54	94	81	57
18 ...	85·9	76·1	61	86·9	76·1	58	Amavashya Holiday.																	
19 ...	86·4	75·1	57	89·9	75·3	47	83	77	70	87	79	70	90	80	65	88	80	71	92	80	59	92	80	59
20 ...	86·9	76·1	58	90·9	73·9	42	83	77	78	88	77	61	91	75	56	88	78	64	95	84	63	99	86	59
21 ...	86·4	77·1	63	88·9	74·8	48	85	76	66	88	77	61	91	78	56	80	75	79	96	79	76	95	79	76
22 ...	87·4	75·6	56	90·9	74·1	42	82	75	72	85	75	55	90	78	59	96	85	73	95	75	47	98	79	43
23 ...	86·4	73·1	50	89·9	72·1	38	Sunday.																	
24 ...	85·9	75·1	58	88·9	74·1	47	79	74	79	80	76	83	88	73	64	...	...	...	92	75	54	91	80	62
25 ...	85·4	73·6	53	87·4	73·1	47	75	73	91	86	77	67	88	77	61	78	76	91	91	79	59	90	79	62
26 ...	74·4	73·1	93	76·4	74·1	88	86	77	67	83	78	80	83	75	80	85	78	64	87	79	70	90	80	65
27 ...	77·4	75·1	89	79·4	76·3	85	Dasera Holiday.																	
28 ...	77·9	74·1	82	82·1	76·1	75	85	80	80	90	80	65	87	79	70	86	80	77	92	81	62	92	82	65
29 ...	82·4	76·1	73	85·9	77·1	65	83	77	76	86	80	77	90	80	65	86	78	70	94	80	62	97	82	53
30 ...	84·4	76·1	66	89·9	71·1	53	88	60	71	86	81	81	88	80	71	90	80	65	91	81	65	95	82	58

October 1906.

Date.	Observatory reading. 10 A. M. D.	W.	H.	4 P. M. D.	W.	H.	New Spinning Mills. Card Room 6 30 A. M. D.	W.	H.	12 NOON. D.	W.	H.	5 P. M. D.	W.	H.	Spinning Room. 6-30 A. M. D.	W.	H.	12 NOON. D.	W.	H.	5 P. M. D.	W.	H.
			%			%			%			%			%			%			%			%
1 ...	85·9	75·1	58	89·9	77·1	53	80	75	79	87	77	64	90	78	59	88	78	64	94	80	54	98	80	46
2 ...	85·4	73·1	59	91·1	73·1	39	79	79	96	81	80	96	89	79	64	90	78	59	92	81	62	94	81	57
3 ...	84·9	75·1	61	89·8	71·1	36	81	75	76	86	79	73	87	78	67	88	86	92	93	78	51	92	80	59
4 ...	84·9	74·6	59	85·1	73·1	54									Sun	day								
5 ...	82·9	74·6	65	88·9	73·1	44	79	74	79	86	77	67	88	79	67	86	78	70	93	78	51	94	80	54
6 ...	83·9	72·6	56	87·9	73·1	46	75	72	87	84	75	66	88	77	61	92	84	72	92	79	56	94	82	60
7 ...	84·9	74·1	53	90·9	73·8	41	80	71	64	87	75	57	88	77	61	75	74	95	86	73	70	84	78	77
8 ...	85·4	75·1	50	89·9	74·1	44	79	74	79	86	78	70	87	77	64	80	78	92	92	78	54	92	80	59
9 ...	86·6	74·8	55	88·9	71·1	38	79	73	75	86	77	67	88	78	64	86	76	63	92	78	54	92	80	59
10 ...	83·9	71·1	50	88·9	71·1	38	83	73	62	85	77	70	88	77	61	84	74	63	93	78	54	92	80	59
11 ...	83·9	73·3	67	86·9	72·1	45	78	72	76	85	76	66	86	77	67	82	74	69	91	78	56	92	80	59
12 ...	84·9	74·1	68	87·9	71·1	40	79	74	79	85	77	70	88	75	55	86	76	63	91	80	62	92	79	56
13 ..	83·9	72·1	54	89·9	71·6	37	78	71	71	85	76	66	87	75	57	84	74	63	91	80	62	90	78	59
14 ...	84·9	72·1	51	89·9	69·3	30	78	71	71	84	73	59	87	74	54	82	74	69	90	76	53	90	76	53
15 ...	84·9	73·1	54	90·4	69·3	30	76	71	73	86	76	63	88	74	52	86	76	63	90	78	59	88	76	58
16 ...	85·4	73·6	55	88·9	72·2	41	79	72	71	86	75	60	88	75	55	82	74	69	90	78	59	90	78	59
17 ...	84·9	73·1	54	90·1	67·1	25								Diw	ali	Holi	day							
18 ...	83·9	70·1	47	89·9	69·6	32									Do									
19 ...	84·4	69·1	43	89·9	68·6	29	78	69	63	85	71	50	85	70	47	76	68	66	81	75	76	80	72	71
20 ...	86·9	69·1	36	89·4	65·1	21	75	72	87	82	71	58	85	73	56	86	76	63	86	76	63	86	76	63
21 ...	84·4	69·1	42	88·9	68·1	30	76	66	59	83	70	52	84	72	56	74	67	70	89	74	49	86	75	60
22 ...	83·9	67·1	37	88·4	65·6	24	75	67	66	81	71	61	84	72	56	82	70	55	86	74	57	86	74	57
23 ...	84·9	68·6	40	88·9	68·1	24	76	65	55	85	68	41	84	70	49	72	67	80	78	71	71	77	71	74
24 .	82·9	66·8	39	90·4	66·6	23																		
25 ...	82·9	67·6	41	89·4	64·6	20	74	65	62	80	71	64	83	71	55	82	68	48	86	74	57	88	72	46
26 ...	83·4	67·6	40	88·1	66·6	28	73	66	69	81	70	58	83	71	55	82	68	48	88	72	46	88	72	46
27 ...	81·9	66·1	39	84·9	66·1	32	70	65	77	81	70	58	81	72	65	80	67	51	83	72	59	82	72	62
28 ...	79·9	64·1	37	84·4	64·6	29									Sun	day.								
29 ...	80·4	68·1	50	82·9	70·6	52	69	65	81	79	72	71	83	75	69	76	66	63	86	73	54	86	74	57
30 ...	80·4	70·6	59	82·9	73·1	60	77	70	71	83	76	73	85	77	70	82	72	62	89	76	65	91	77	53
31 .	81·4	73·1	65	83·4	74·6	64	78	75	87	84	77	73	86	80	77	86	76	63	90	78	69	90	78	59

November 1906.

Date.	Observatory reading.						New Spinning Mills.																	
							Card Room.									Spinning Room.								
	10 A. M.			4 P. M.			6-30 A. M.			12 Noon.			5 P. M.			6-30 A. M.			12 Noon.			5 P. M.		
	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.
			%			%			%			%			%			%			%			%
...	82·4	75·1	69	87·9	76·1	56	82	77	80	81	70	80	86	79	73	88	78	64	90	89	65	90	76	59
...	78·4	74·1	80	80·9	73·1	67	77	71	74	85	79	77	88	70	67	86	79	73	92	80	59	93	78	51
...	79·9	73·1	70	86·9	74·1	52									Holiday.									
...	82·9	66·1	36	88·4	65·1	31	74	68	74	82	70	65	85	73	56	80	70	61	90	72	71	87	73	51
...	80·9	66·1	42	88·4	65·0	23	74	66	66	80	71	64	81	74	72	84	78	77	88	72	46	85	70	40
...	80·9	66·1	42	88·1	66·6	28	72	64	65	78	71	71	80	73	72	82	76	76	88	74	52	90	76	53
...	80·5	63·1	33	87·4	63·8	21	73	64	61	78	69	63	79	72	71	84	72	56	87	74	54	84	72	56
...	79·4	63·1	37	87·4	65·7	21	70	62	64	78	68	60	79	71	69	76	64	52	82	71	58	80	72	68
...	79·4	64·6	41	87·9	66·4	27	70	63	68	79	70	64	79	70	64	77	65	52	84	72	56	82	72	62
...	79·9	65·1	41	87·9	65·1	23	71	64	68	78	71	71	80	71	64	78	66	53	84	73	59	83	72	59
...	79·4	65·1	42	87·4	65·6	26									Sunday.									
...	82·4	66·1	40	88·6	68·1	31	70	66	81	78	71	71	80	71	64	78	60	37	84	72	56	86	72	51
...	81·4	67·6	45	88·4	66·1	25	71	64	68	78	71	71	81	72	65	81	69	54	86	72	51	86	71	48
...	81·9	67·1	42	87·9	67·1	29	69	64	76	78	72	75	80	71	64	78	68	60	85	73	56	85	72	53
...	78·9	64·1	43	86·4	64·6	25	72	65	69	78	69	63	79	71	68	78	68	60	84	73	59	82	72	62
...	78·4	63·1	38	85·4	64·6	27	71	63	64	77	68	63	80	71	64	76	66	59	82	72	62	82	71	58
...	77·9	62·6	38	84·9	64·1	26	71	63	64	77	64	49	80	72	68	76	66	59	83	73	62	83	72	59
...	78·4	64·1	41	83·9	63·6	27									Sunday.									
...	78·9	64·1	40	82·4	66·1	38	67	61	71	76	68	66	80	70	61	72	64	65	82	71	58	82	72	62
...	78·9	66·1	49	82·9	65·6	36	71	65	72	78	71	71	80	71	64	74	66	66	83	73	62	82	70	55
...	78·9	67·6	53	81·4	65·1	37	71	65	72	79	70	64	81	70	58	76	66	59	85	72	53	83	71	55
...	77·9	65·6	48	82·1	65·8	38	72	68	82	79	69	60	80	68	54	70	63	68	78	71	71	77	69	67
...	78·4	64·6	43	83·4	65·6	34	72	64	65	78	70	67	79	72	71	76	66	59	83	73	62	83	72	59
...	75·9	63·1	45	82·4	65·6	36	72	64	65	77	69	67	79	71	68	76	66	59	83	72	59	84	71	59
...	74·9	61·1	40	79·9	61·1	28									Sunday.									
...	74·9	61·1	40	81·4	62·1	28	64	56	60	66	74	52	77	68	63	83	69	49	82	72	62	82	70	55
...	74·6	60·1	40	81·4	63·1	31	66	58	61	76	68	66	77	68	63	74	62	50	82	70	55	82	68	48
...	73·9	60·1	40	81·9	63·6	28	66	59	66	75	67	66	77	69	67	82	69	52	81	69	54	82	70	55
...	74·9	60·1	37	82·4	62·1	26	67	59	62	75	67	66	77	70	71	72	61	53	82	69	52	83	72	59
...	73·9	59·2	36	80·9	63·1	32	72	62	57	75	66	62	77	69	67	74	62	50	81	69	54	83	67	43

December 1906.

Date.	Observatory Reading.						New Spinning Mills. Card Room.									New Spinning Mills. Spinning Room.								
	10 A.M.			4 P.M.			6-30 A.M.			12 NOON.			5 P.M.			6-30 A.M.			12 NOON.			5 P.M.		
	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.
1	74·4	60·0	% 33	82·9	64·8	% 32	70	61	% 60	78	67	% 56	78	67	% 56	76	72	% 82	83	70	% 52	83	68	% 46
2	75·9	61·0	38	82·9	63·3	27									Sunday.									
3	74·9	61·0	40	82·9	62·6	26	74	64	58	77	69	67	78	69	63	72	62	57	82	70	55	83	70	52
4	74·4	61·1	43	81·4	63·1	31	73	63	57	78	69	63	79	69	60	72	64	65	84	70	49	83	69	49
5	74·6	60·6	40	79·9	61·8	30	74	67	70	77	68	63	78	69	63	76	64	52	81	70	58	81	68	51
6	72·9	61·1	46	79·4	62·1	32	71	64	68	75	65	68	77	70	71	74	64	68	81	70	58	82	69	52
7	72·9	60·1	43	79·9	61·1	28	70	64	72	75	68	70	77	68	63	74	64	68	80	69	57	82	68	48
8	71·9	60·1	46	80·9	60·1	23	70	64	72	75	68	70	77	66	56	74	64	68	82	69	52	82	68	48
9	72·9	60·1	43	80·9	62·1	29									Sunday.									
10	72·0	60·0	43	81·9	62·9	30	68	62	71	77	69	67	78	69	63	74	62	50	81	68	51	83	69	49
11	72·9	58·8	38	83·1	61·6	24	70	61	60	75	68	70	77	67	59	72	66	73	81	67	48	84	68	44
12	73·4	60·1	41	81·9	63·6	32	74	66	66	76	67	63	78	68	60	74	66	66	80	68	54	83	68	46
13	72·7	60·8	46	79·9	64·1	37	72	62	67	78	68	60	80	68	54	72	64	65	80	71	64	82	71	58
14	73·9	62·6	50	80·1	63·1	34	72	62	57	78	68	60	80	68	64	73	66	69	80	71	64	81	71	61
15	71·4	63·6	50	79·9	61·6	30	74	62	50	77	68	63	78	66	63	72	63	61	79	70	64	79	68	57
16	69·9	59·0	48	80·7	63·1	32									Sunday.									
17	71·9	60·0	46	81·7	62·1	26	71	61	56	78	66	53	78	68	60	71	62	60	79	61	34	79	66	50
18	72·4	61·5	50	84·5	66·1	33	72	62	57	78	68	60	80	70	61	73	63	57	79	69	60	81	70	58
19	74·4	68·1	70	81·2	69·6	52	80	68	54	82	74	69	82	74	69	78	70	67	84	76	69	84	76	69
20	75·9	70·1	73	84·7	68·5	40	78	70	67	82	74	69	80	72	68	79	71	68	84	76	69	83	75	69
21	76·5	68·6	65	79·0	68·6	57	78	70	67	84	74	63	84	74	63	77	70	71	83	75	69	83	75	69
22	77·7	68·6	61	77·7	69·0	61	80	72	68	84	76	69	84	76	69	79	68	57	85	74	60	85	76	66
23	76·5	67·6	61	83·0	68·6	45									Sunday.									
24	74·0	64·6	54	85·5	69·8	42	78	68	60	82	72	62	84	73	59	77	69	67	84	76	69	84	73	59
25	73·1	60·1	43	82·0	65·1	36	76	65	55	78	69	63	80	70	61	80	66	47	80	70	61	82	72	62
26	68·1	53·1	30	79·6	56·6	16	69	58	51	73	63	57	75	64	55	72	66	73	80	66	47	80	66	47
27	68·9	53·3	27	81·0	59·1	20	70	56	48	72	61	53	76	65	55	72	58	42	80	62	35	85	64	30
28	71·9	58·0	38	65·9	63·1	84	74	61	47	75	65	58	78	72	75	74	60	43	80	62	35	83	72	59
29	67·4	66·1	92	71·1	68·3	85	80	72	68	80	75	79	81	75	76	78	70	67	82	79	88	84	76	69
30	67·9	66·2	90	74·3	69·1	74	86	76	63	85	78	73	83	76	73	80	74	75	82	75	72	84	74	63
31	72·9	68·6	79	81·5	69·1	50	80	72	68	80	74	75	83	74	66	80	70	61	81	73	68	87	75	57

February 1907.

ate.	Observatory Reading.						New Spinning Mills.																	
							Card Room.									Spinning Room.								
	10 A. M.			4 P. M.			6-30 A. M.			12 NOON.			5 P. M.			6-30 P.M.			12 NOON.			5 P. M.		
	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.
...	69·9	54·0	% 28	82·0	58·0	% 15	72	58	% 42	74	62	% 50	76	64	% 52	75	60	% 40	80	64	% 41	82	66	% 42
...	70·9	56·0	33	83·5	66·1	33	72	62	57	74	64	58	78	69	63	75	62	47	81	66	44	82	70	55
...	77·0	67·1	57	85·0	67·1	35									Sun	day.								
...	78·0	66·1	50	84·8	66·1	32	76	66	59	81	72	65	80	72	68	76	66	59	84	72	56	85	72	53
...	78·0	63·1	39	82·2	65·1	35	82	70	55	80	70	61	81	71	61	81	69	54	86	72	51	87	74	54
...	69·4	66·6	85	79·0	66·9	49	80	76	83	82	79	88	84	80	84	78	70	67	84	74	63	87	73	51
...	72·6	61·0	46	80·5	64·1	36	76	70	74	79	66	50	81	68	51	76	68	66	82	68	48	87	70	42
...	72·6	62·6	55	82·0	63·6	32	77	68	63	79	69	60	78	69	63	76	66	59	83	70	52	83	70	52
...	73·4	61·0	45	85·5	67·1	34	76	65	55	78	69	63	81	72	65	76	66	59	83	68	80	84	72	56
...	75·0	66·6	62	85·8	70·4	44	78	72	75	82	74	69	86	76	63	77	70	71	85	74	60	88	75	55
...	71·9	67·6	78	85·0	69·9	43	84	73	69	86	76	63	88	80	71	82	73	65	88	77	61	90	75	50
...	74·4	68·1	70	83·9	69·9	·47									Holi	day.								
...	74·4	61·6	44	84·0	63·3	26	76	68	66	80	66	47	80	68	54	78	70	67	84	72	56	83	71	55
...	77·9	61·6	49	81·5	63·6	33	76	66	59	78	68	60	79	68	57	78	67	56	84	70	49	84	73	59
...	78·0	63·1	39	85·6	67·6	36	76	66	59	80	71	64	82	73	65	80	68	54	87	74	54	84	76	69
...	79·0	66·6	49	88·8	69·6	34	80	70	61	83	73	62	83	74	66	80	70	61	88	75	55	88	79	67
...	75·0	69·1	72	69·9	65·1	75									Sun	day.								
...	70·9	65·6	73	81·8	69 6	52	78	72	75	82	74	69	84	75	66	78	72	75	82	74	69	88	77	61
...	65·4	63·1	87	76·0	68·7	67	78	71	71	84	76	69	83	74	66	73	70	86	82	73	65	85	75	63
...	71·4	63·6	62	81·0	65·6	40	76	70	74	80	72	68	84	70	49	76	70	74	82	72	62	88	74	52
1 ...	70 9	60·5	51	82·5	62·6	27	72	62	57	79	66	50	84	68	44	74	66	66	82	69	52	88	72	46
2 ...	70·9	57·6	40	83·2	61·6	23	74	64	58	76	65	55	78	69	63	75	66	62	82	68	48	83	73	62
3 ...	75·0	60·5	39	88·9	64·8	21	74	64	58	77	67	59	75	66	62	82	69	52						
4 ...	75·0	62·6	46	91·1	67·1	23									Sun	day.								
5 ...	82·0	65·6	38	92·6	66·1	19	75	66	62	80	71	64	84	72	56	77	67	59	88	73	49	87	74	54
6 ...	81·0	66·1	42	89·9	65·6	22	74	69	78	80	70	61	82	72	62	80	70	61	88	72	46	84	74	63
7 ...	81·0	64·6	37	90·1	67·8	27	74	67	70	79	71	68	78	68	60	84	73	59						
8 ...	79·0	62·6	35	90·6	65·1	19									Holi	day.								

January 1907.

Date.	Observatory Reading.						New Spinning Mills.																	
							Card Room.									Spinning Room.								
	10 A. M.			4 P.M.			6-30 A. M.			12 NOON.			5 P. M.			6 30 A. M.			12 NOON.			5 P. M.		
	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.	D.	W.	H.
			%			%			%			%			%			%			%			%
1 ...	71·4	60·1	49	81·0	62·1	29									Holiday									
2 ...	69 4	57·0	42	82·0	60 4	25	64	67	65	72	64	65	75	66	62	67	57	63	79	64	43	81	63	35
3 ...	69·6	56·0	36	82 1	59·5	18	70	60	55	72	63	61	75	65	58	74	62	50	79	62	37	82	63	33
4 ...	69·6	56·5	39	81 0	60·2	27	71	61	56	72	66	78	74	65	62	74	62	50	80	64	41	82	65	39
5 ...	69·4	67·5	44	81·0	61 0	26	70	64	72	73	67	73	75	65	58	72	62	57	81	67	48	83	66	40
6 ...	68 9	58 0	47	82 0	62·8	28									Sunday.									
7 ...	69·9	59·5	49	81·7	62·6	28	71	63	64	73	67	73	74	65	62	70	63	63	80	68	54	82	68	48
8 ...	72·6	62 1	52	82·0	65 6	38	73	65	65	76	70	74	79	69	60	76	62	45	83	71	55	84	70	49
9 ...	68·9	62·6	68	72 3	66 6	71	79	72	71	83	76	73	82	76	76	82	70	55	83	74	66	87	76	60
10 ...	68·9	66·1	85	79·0	67·6	54	77	70	71	81	74	72	81	73	68	78	70	67	84	75	66	83	72	59
11 ...	70·4	63 6	66	79 8	64 9	41	77	65	52	76	70	74	77	70	71	76	66	59	82	71	58	82	70	55
12 ...	71·4	61·6	54	79 5	62·8	34	72	64	65	76	67	63	75	68	70	74	64	58	82	69	52	82	68	48
13 ...	70·4	60·1	51	80·2	62 9	33	68	64	81	74	67	70	75	66	62	72	64	65	80	68	54	83	67	43
14 ...	68·6	67·6	47	76 8	60 1	31									Holiday.									
15 ...	66 9	65·5	43	79 2	60·6	27	69	61	63	71	65	72	74	66	66	72	60	49	80	66	29	81	64	38
16 ...	67·9	58·0	51	81 0	64 6	37	65	63	90	73	67	73	75	68	70	72	60	49	80	66	29	82	67	45
17 ...	69·9	58 0	44	80·1	62 6	32	73	64	61	74	67	70	75	68	70	74	62	50	80	68	54	80	67	51
18 ...	68·4	55·0	37	79 0	61 0	30	71	56	77	73	65	65	74	65	62	74	60	82	79	65	47	82	66	42
19 ...	67 9	54 5	35	81·0	61·5	27	69	59	55	72	64	65	75	65	58	72	60	49	80	64	41	82	64	36
20 ...	71·9	57·0	34	84·7	62·0	21									Sunday									
21 ...	70·9	57 5	39	86 6	62 6	20	70	61	60	72	66	73	77	66	56	70	60	55	80	66	29	84	66	39
22 ...	73 9	59 0	36	88 9	64·1	19	69	66	86	75	69	74	78	67	56	76	61	41	83	68	46	86	68	39
23 ...	72 9	58 2	35	91 0	62 4	11	69	65	81	73	67	73	76	68	66	76	64	52	84	70	49	86	70	45
24	72 7	59 0	39	90 1	63 1	15	73	62	53	75	69	74	79	66	50	76	63	45	75	66	62	82	70	65
25 ...	75 1	58·5	30	89 6	65·2	21								Mohamedan Holiday.										
26 ...	77·0	63 5	44	89 9	65·2	20	73	68	78	77	70	71	79	72	71	78	68	60	84	72	56	87	76	60
27 ...	80 0	64 9	41	91 6	66·1	21	78	70	67	80	73	65	80	72	68	78	70	67	87	72	48	88	72	46
28 ...	79 0	60·0	27	91 1	62 6	13	71	65	74	66	66	66	79	69	60	80	64	41	86	70	45	87	69	40
29 ...	75·5	60·0	35	90·6	64·6	19	72	64	65	75	68	70	76	70	74	78	61	46	84	69	46	86	70	45
30 ...	78 0	62 6	38	88·5	64·1	19	78	67	56	79	72	71	81	72	65	80	66	47	86	72	51	88	72	46
31 ...	77 0	60·0	31	83·5	61·5	22	77	65	52	77	68	63	78	70	67	80	66	47	85	68	41	84	68	44

The AHMEDABAD GINNING and MANUFACTURING Co. Ld., AHMEDABAD.

Hygrometer Readings.

Date.	Time.	Dry Bulb.	Wet Bulb.	Percentage of Humidity.	Grains per cubic foot of Air.	Remarks.
1st December 1905 ...	8 A. M.	76	68	63	6·1	
	11 A. M.	82	71	54	6·3	
	2-30 P. M.	87	74	49	6·6	
2nd do. ...	8 A. M.	79	68	53	5·6	
	11 A. M.	83	78	76	8·2	
	2 P. M.	88	79	61	8·6	
	4-30 P. M.	91	75	42	6·5	
3rd do. ...	8 A. M.	79	69	56	6·	
	11 A. M.	81	70	53	6·0	
	2 P. M.	85	72	49	6·2	
	4-30 P. P.	87	73	46	6·3	
4th do. ...	8 A. M.	79	68	53	5·6	
	4-30 P. M.	90	74	42	6·2	
5th do. ...	8 A. M.	79	68	53	5·6	
	2 P. M.	88	74	46	6·5	
	4 P. M.	90	75	44	6·6	
6th do. ...	9 A. M.	78	67	53	5·5	
	2 P. M.	86	71	52	6·8	
	4-30 P. M.	90	75	44	6·6	
7th do. ...	8 A. M.	78	68	56	5·8	
	2 P. M.	84	70	45	5·6	
	4-30 P. M.	88	73	43	6·1	
8th do. ...	4-30 P. M.	88	73	43	6·1	
9th do. ...	8 A. M.	73	64	...	...	
	2 P. M.	84	70	...	...	
11th do. ...	8 A. M.	74	65	58	5·3	
	2 P. M.	84	70	45	5·6	
	4-30 P. M.	86	72	46	6·1	
12th do. ...	8 A. M.	81	74	68	7·6	
	2 P. M.	83	70	48	5·8	
	4-30 P. M.	85	74	55	7·0	
13th do. ...	8 A. M.	81	75	72	8·1	
	2 P. M.	84	74	57	7·1	
14th do. ...	8 A. M.	75	66	58	5·5	
	2 P. M.	85	77	64	8·3	
15th do. ...	8 A. M.	77	69	63	6·3	
	3 P. M.	89	74	43	6·4	
18th do. ...	8 A. M.	77	68	59	5·9	
19th do. ...	8 A. M.	80	71	59	6·6	
	2 P. M.	94	88	74	12·3	
23rd do. ...	8 A. M.	75	66	58	5·5	
28th do. ...	9 A. M.	80	74	71	7·8	
	2 P. M.	87	78	61	8·3	
29th do. ...	8 A. M.	81	75	72	8·1	
30th do. ...	8 A. M.	76	71	75	7·2	

Date.		Time.	Dry Bulb.	Wet Bulb.	Percentage of Humidity.	Grains per cubic foot of Air	Remarks.
4th January 1906	..	8 A. M.	71	65	69	5·7	
9th do.	...	3 P. M.	84	69	41	5·0	
10th do.	...	9-30 A. M.	85	76	61	7·8	
		2 P. M.	80	72	63	7·0	
11th do	..	11 A. M.	75	65	...	...	
12th do.	...	7-30 A. M.	72	60	48	4·1	
		2 P. M.	82	70	51	5·9	
13th do.	...	7 A. M.	73	63	49	4·6	
		2 P. M.	82	69	48	5·6	
15th do.	...	7 A. M.	77	66	53	5·5	
		2 P. M.	82	69	48	5·6	
16th do.	...	7 A. M.	77	66	53	5·5	
		2 P. M.	82	70	51	5·9	
17th do.	...	7 A. M.	77	66	53	5·5	
18th do.	...	7 A. M.	78	67	53	5·5	
		2 P. M.	85	72	49	6·2	
19th do.	...	2 P. M.	85	74	55	7·0	
20th do.	...	7 A. M.	81	69	50	5·7	
		1 P. M.	86	70	40	5·4	
22nd do.	...	2 P. M.	80	69	53	5·8	
24th do.	...	2 P. M.	82	72	57	6·4	
25th do.	...	11 A. M.	78	67	53	5·5	
		2 P. M.	82	69	48	5·6	
26th do.	...	4 P. M.	86	71	43	5·7	
27th do.	...	11 A. M.	76	67	57	5·7	
29th do.	...	1-30 P. M.	76	61	40	3·9	
		4-30 P. M.	81	69	50	5·7	
30th do.	...	8 A. M.	74	58	37	3·4	
		2-30 P. M.	80	68	50	5·5	
6th February 1906	...	9 A. M.	78	68	56	5·8	
		2 P. M.	84	71	48	6·0	
7th do.	...	2 P. M.	83	71	...	...	
9th do.	...	2 P. M.	85	77	64	8·3	
10th do.	...	8 A. M.	76	69	69	6·1	
		2 P. M.	81	71	56	6·4	
12th do.	...	12 A. M.	79	70	59	6·4	
		2 P. M.	81	71	56	6·4	
13th do.	...	2 P. M.	83	72	54	6·7	
15th do.	...	12 A. M.	82	75	68	7·9	
		2 P. M.	83	76	68	8·2	

Date.		Time.	Dry Bulb.	Wet Bulb.	Percentage of Humidity.	Grains per cubic foot of Air.	Remarks.
16th February 1906	...	2 P. M.	77	68	59	5·9	
17th do.	...	11 A. M.	76	70	71	6·8	
24th do.	...	4 P. M.	84	68	41	5·0	
2nd March 1906	...	9 A. M.	78	61	37	3·8	
		4 P. M.	96	75	33	5·9	
3rd do.	...	9 A. M.	84	65	41	5·0	
		2 P. M.	94	74	35	5·7	
		4 P. M.	100	78	32	6·4	
4th do.	...	7 A. M.	82	68	45	5·2	
		2 P. M.	92	72	34	5·3	
5th do.	...	2 P. M.	95	77	39	6·7	
		5 P. M.	100	88	43	8·4	
7th do.	...	2 P. M.	92	70	30	4·8	
8th do.	...	7-30 A. M.	82	67	42	4·9	
		2 P. M.	93	73	34	5·5	
9th do.	...	7 A. M.	81	70	53	6·0	
10th do.	...	7 A. M.	82	72	57	6·7	
12th do.	...	7-30 A. M.	78	70	68	6·5	
13th do.	...	7 A. M.	80	69	53	5·8	
14th do.	...	7 A. M.	80	69	53	5·8	
15th do.	...	7 A. M.	84	72	51	6·8	
		2 P. M.	97	77	35	6·4	
		5 P. M.	99	77	32	6·2	
16th do.	...	7 A. M.	89	71	37	5·4	
		2 P. M.	101	81	37	7·5	
17th do.	...	7 A. M.	87	74	49	6·6	
		3 P. M.	98	78	36	6·7	
19th do.	...	7 A. M.	83	70	56	6·2	
		2 P. M.	95	73	41	7·1	
20th do.	...	7 A. M.	85	76	61	7·3	
		2 P. M.	91	79	53	8·1	
21st do.	...	7 A. M.	83	75	64	7·7	
22nd do.	...	7 A. M.	85	76	61	7·8	
		2 P. M.	97	81	44	4·8	
24th do.	...	2 P. M.	95	84	57	9·8	
27th do.	...	2 P. M.	92	78	47	7·5	
		6 P. M.	97	77	35	6·4	
28th do.	...	2 P. M.	92	77	45	7·1	
		4 P. M.	99	81	40	7·7	
29th do.	...	3-30 P. M.	101	82	39	7·9	
30th do.	...	9-30 A. M.	87	75	46	6·7	
		4-30 P. M.	98	80	40	7·4	

Date.		Time.	Dry Bulb.	Wet Bulb.	Percentage of Humidity	Grains per cubic foot of Air.	Remarks
2nd April 1906	...	1-30 P. M.	97	77	35	6·4	
5th do.	...	7-30 P. M.	94	80	48	8·0	
7th do.	...	4 P. M.	101	80	35	7·1	
9th do.	...	7 A. M. 4 P. M.	85 100	75 77	58 30	7·4 6 1	
10th do.	...	7 A. M. 4 P. M.	85 98	74 77	55 34	7·0 6 3	
12th do.	...	2 P. M.	99	78	34	6·6	
21st do.	...	4 P. M.	107	85	35	8 4	
25th do.	...	4 P. M.	104	84	38	8 4	
28th June 1906	...	7 A. M.	93	88	78	12 6	
29th do.	...	7 A. M. 1 P. M.	94 101	89 93	78 68	13 0 13·8	

Records of Temperature and Humidity in certain Spinning Mills in Lancashire.

Information collected by Sir H. Freer-Smith, Mr. Williams and Mr. Ernst in the Autumn of 1908.

Locality of Mill.	Counts.	Temperature. Indoor. Dry.	Indoor. Wet.	Indoor. Humidity.	Outdoor. Dry.	Outdoor. Wet.	Outdoor. Humidity.
Bury	24	90	71	36 per cent.	55	51	75 per cent.
Preston	30	88	67	39 "	58	53	71 "
"	32	95	73	36 "	61	55	64 "
"	38	85	69	40 "	61	55	64 "
Colne	26, 32, 40	88	63	35 "		Not	stated.
"	24—44	85	63	36 "		Not	stated.
Bury	34	79	68	58 "	56	51	75 per cent.
"	34	89	64	29 "	56	51	75 "
"	17 to 40	88	70	36 "	56	55	93 "
"	34	91	78	50 "	56	55	93 "
"	34	80	68	50 "	56	55	93 "
"	34	82	70	50 "	56	55	93 "
Bolton	36—40	86	70	40 "	65	59	64 "
Colne	24—44	85	67	35 "		Not	stated.
Preston	42	82	64	35 "	62	55	64 "
"	40	82	65	40 "	58	53	71 "
Colne	46	79	65	48 "		Not	stated.
"	46	80	67	47 "		Not	stated.
Bolton	50	85	71	45 "	66	59	64 "
"	56	92	75	42 "	68	57	67 "
"	56—64	89	75	47 "	68	57	67 "
"	55	97	78	37 "	68	57	67 "
"	56—64	91	74	40 "	68	57	67 "
Ancoats	60	90	75	44 "	68	65	63 "
Bolton	60	97	77	36 "	65	57	59 "
"	64	92	73	36 "	68	57	67 "
"	60—70	85	71	48 "	68	57	67 "
"	68	91	74	40 "	68	57	67 "
"	60—100	89	77	52 "	65	58	61 "
"	70—80	72	63	57 "	52	50	86 "
"	80	94	75	37 "	65	57	60 "
Preston	88	92	76	42 "	62	55	64 "
Bolton	90—98	87	73	45 "	63	57	67 "
"	84—120	87	72	42 "	52	50	86 "
"	84—120	82	67	42 "	52	50	86 "
"	100	90	77	50 "	64	60	77 "
"	100	88	73	48 "	64	60	77 "
"	108	84	70	44 "	64	60	77 "
Manchester ...	100—160	84	71	48 "	61	56	71 "
"	100—160	88	71	51 "	61	56	71 "
Bolton	134	85	73	46 "	64	60	77 "
Manchester ...	135	81	71	56 "	64	57	68 "
Bolton	152—160	87	74	44 "	66	59	64 "
"	152—160	84	72	51 "	66	59	64 "
Manchester ...	165—280	91	74	42 "	61	56	71 "
"	195—275	90	75	44 "	61	56	71 "
Ancoats	210	91	76	44 "	65	58	65 "

HUMID COTTON CLOTH FACTORIES—BLACKBURN C. C. F. DISTRICT.

Temperatures read at various times between January 1st and October 31st 1913.

55° to 59° F (inclusive) were read in 2 sheds.
60° to 64° F (inclusive) " " 19 "
65° to 69° F (inclusive) " " 77 "
70° to 74° F (inclusive) " " 62 "
75° to 79° F (inclusive) " " 65 "
80° to 84° F (inclusive) " " 25 "
85° to 89° F (inclusive) " " 6 "
90° to 94° F (inclusive) " " 1 "

THE DAVID MILLS Co., Ld., BOMBAY.

Mill No. 2.

Time.		Ring Room. No Ventilator or Humidifier.	Mule Room Hart's Ventilator and Humidifier working	Outside Temperature in the shade.	Month and date.
10 A.M.	...	99°	95°	87°	25th April 1906.
4 P.M.	...	100°	97°	84°	
10 A.M.	...	100°	96°	83°	26th do.
4 P.M.	..	101°	97°	85°	
10 A.M.	..	100°	95°	87°	27th do.
4 P.M.	...	101°	96°	87°	
10 A.M.	...	101°	97°	87°	28th do.
4 P.M.	..	100°	98°	85°	
10 A.M.	...	100°	96°	85°	29th do.
4 P.M.	...	101°	97°	86°	
10 A.M.	..	96°	92°	85°	30th do.
4 P.M.	...	100°	96°	84°	
10 A.M.	...	100°	95°	84°	1st May 1906.
4 P.M.	...	95°	93°	85°	
10 A.M.	...	95°	94°	86°	3rd do.
4 P.M.	.	98°	96°	86°	
10 A.M.	..	100°	96°	86°	4th do.
4 P.M.	...	100°	96°	85°	
10 A.M.	...	95°	91°	89°	5th do.
4 P.M.	..	92°	92°	88°	
10 A.M.	...	91°	89°	90°	7th do.
4 P.M.	...	92°	90°	88°	
10 A.M.	...	96°	91°	87°	8th do.
4 P.M.	...	94°	92°	90°	
10 A.M.	...	95°	91°	87°	9th do.
4 P.M.	...	95°	93°	88°	
10 A.M.	...	96°	94°	88°	10th do.
4 P.M.	...	97°	95°	87°	
10 A.M.	..	97°	95°	88°	11th do.
4 P.M.	..	98°	97°	86°	
10 A.M.	..	93°	93°	89°	12th do.
4 P.M.	...	94°	94°	88°	
10 A.M.	..	91°	91°	87°	14th do.
4 P.M.	..	93°	93°	88°	
10 A.M.	..	95°	93°	87°	15th do.
4 P.M.	...	96°	95°	88°	
10 A.M.	.	95°	94°	88°	16th do.
4 P.M.	...	94°	95°	90°	
10 A.M.	...	96°	96°	87°	17th do.
4 P.M.	..	97°	97°	87°	

Time.	Ring Room. No Ventilator or Humidifier.	Mule Room. Hart's Ventilator and Humidifier working.	Outside Temperature in the shade.	Month and date.
10 A.M. ...	95°	95°	88°	18th May 1906.
4 P.M. ...	96°	97°	88°	
10 A.M. ...	97°	96°	86°	19th do.
4 P.M. ...	96°	97°	85°	
10 A.M. ...	98°	97°	87°	21st do.
4 P.M. ..	98°	97°	88°	
10 A.M. ...	99°	98°	87°	22nd do.
4 P.M. ...	98°	99°	87°	
10 A.M. ...	97°	98°	88°	23rd do.
4 P.M. ...	97°	99°	88°	
10 A.M. ...	96°	97°	87°	24th do.
4 P.M. ...	97°	97°	89°	
10 A.M. ...	95°	96°	87°	25th do.
4 P.M. ...	96°	96°	89°	
10 A.M. ...	94°	96°	90°	26th do.
4 P.M. ...	95°	97°	89°	
10 A.M. ...	92°	93°	89°	28th do.
4 P.M. ...	94°	94°	91°	
10 A.M. ...	94°	93°	89°	29th do.
4 P.M. ...	94°	95°	90°	
13 A.M. ...	94°	93°	91°	30th do.
4 P.M. ...	95°	95°	92°	
10 A.M. ...	94°	94°	90°	31st do.
4 P.M. ...	95°	95°	91°	
10 A.M. ...	93°	94°	90°	1st June 1906.
4 P.M. ...	95°	94°	90°	
10 A.M. ...	95°	94°	91°	2nd do.
4 P.M. ...	96°	95°	90°	
10 A.M. ...	96°	95°	89°	4th do.
4 P.M. ...	95°	94°	89°	
10 A.M. ...	100°	98°	88°	6th do.
4 P.M. ...	100°	99°	88°	
10 A.M. ...	100°	99°	87°	7th do.
4 P.M. ...	101°	99°	88°	
10 A.M. ...	99°	98°	87°	8th do.
4 P.M. ...	96°	97°	90°	
10 A.M. ...	100°	97°	86°	9th do.
4 P.M. ...	95°	97°	92°	
10 A.M. ...	97°	95°	88°	11th do.
4 P.M. ...	96°	95°	88°	
10 A.M. ...	100°	98°	85°	12th do.
4 P.M. ...	96°	95°	86°	
10 A.M ...	99°	98°	90°	13th do.
4 P.M. ...	97°	97°	89°	

Time.		Ring Room No Ventilator or Humidifier.	Mule Room. Hart's Ventilator and Humidifier working.	Outside Temperature in the shade.	Month and date.
10 A. M.	...	101°	93°	87°	14th June 1906.
4 P. M.	...	95°	95°	83°	
10 A. M.	...	94°	96°	88°	15th do.
4 P. M.	...	95°	95°	87°	
10 A. M.	...	94°	96°	89°	16th do.
4 P. M.	...	97°	96°	91°	
10 A. M.	...	100°	96°	86°	18th do.
4 P. M.	...	100°	97°	89°	
10 A. M.	...	98°	95°	84°	19th do.
4 P. M.	...	98°	97°	87°	
10 A. M.	...	96°	93°	87°	20th do.
4 P. M.	...	96°	94°	90°	
10 A. M.	...	100°	97°	85°	21st do.
4 P. M.	...	96°	93°	85°	
10 A. M.	...	96°	95°	89°	22nd do.
4 P. M.	...	93°	93°	91°	
10 A. M.	...	98°	93°	89°	23rd do.
4 P. M.	...	95°	93°	89°	
10 A. M.	...	96°	93°	90°	25th do.
4 P. M.	...	96°	93°	91°	
10 A. M.	...	97°	92°	90°	26th do.
4 P. M.	...	95°	93°	92°	
10 A. M.	...	97°	93°	89°	27th do.
4 P. M.	...	95°	93°	93°	
10 A. M.	...	96°	94°	88°	28th do.
4 P. M.	...	96°	93°	90°	
10 A. M.	...	97°	94°	89°	30th do.
4 P. M.	...	97°	93°	93°	
10 A. M.	..	97°	91°	85°	1st July 1906.
4 P. M.	...	96°	92°	89°	
10 A. M.	...	96°	94°	85°	3rd do.
4 P. M.	...	93°	94°	90°	
10 A. M.	...	99°	93°	87°	4th do.
4 P. M.	...	96°	94°	88°	
10 A. M.	...	99°	95°	85°	5th do.
4 P. M.	...	98°	94°	84°	
10 A. M.	...	98°	95°	87°	6th do.
4 P. M.	..	95°	96°	86°	
10 A. M.	...	96°	94°	87°	7th do.
4 P. M.	...	95°	95°	90°	
10 A. M.	...	95°	92°	85°	9th do.
4 P. M.	...	97°	91°	87°	
10 A. M.	...	97°	95°	87°	10th do.
4 P. M.	...	96°	93°	90°	

Time.	Ring Room. No Ventilator or Humidifier.	Mule Room. Hart's Ventilator and Humidifier working.	Outside Temperature in the shade.	Month and Date.
10 A. M. ...	95°	96°	87°	11th July 1906.
4 P. M. ...	96°	95°	89°	
10 A. M. ...	95°	96°	87°	12th do.
4 P. M. ...	95°	95°	89°	
10 A. M. ...	96°	95°	88°	13th do.
4 P. M. ...	98°	95°	88°	
10 A. M. ...	100°	97°	84°	14th do.
4 P. M. ...	99°	97°	83°	
10 A. M. ...	99°	95°	83°	16th do.
4 P. M. ...	97°	95°	82°	
10 A. M. ...	102°	98°	81°	17th do.
4 P. M. ...	103°	98°	82°	
10 A. M. ...	100°	94°	83°	20th do.
4 P. M. ...	98°	93°	81°	
10 A. M. ...	98°	94°	83°	21st do.
4 P. M. ...	97°	92°	84°	
10 A. M. ...	98°	92°	81°	23rd do.
4 P. M. ...	95°	93°	81°	
10 A. M. ...	98°	91°	81°	24th do.
4 P. M. ...	97°	93°	84°	
10 A. M. ...	99°	93°	82°	25th do.
4 P. M. ...	95°	94°	85°	
10 A. M. ...	96°	92°	85°	27th do.
4 P. M. ...	95°	92°	85°	
10 A. M. ..	95°	92°	83°	28th do.
4 P. M. ...	94°	92°	86°	
10 A. M. ...	96°	94°	86°	29th do.
4 P. M. ...	95°	95°	88°	
10 A. M. ...	98°	95°	86°	30th do.
4 P. M. ...	96°	95°	88°	
10 A. M. ...	99°	95°	86°	31st do.
4 P. M. ...	98°	96°	87°	
10 A. M. ...	99°	96°	86°	1st August 1906.
4 P. M. ...	97°	95°	87°	
10 A. M. ...	99°	93°	87°	2nd do.
4 P. M. ...	98°	93°	87°	
10 A. M. ...	100°	96°	85°	7th do.
4 P. M. ...	97°	95°	86°	
10 A. M. ...	97°	93°	86°	8th do.
4 P. M. ...	95°	94°	86°	
10 A. M. ...	98°	94°	87°	9th do.
4 P. M. ...	98°	94°	86°	
10 A. M. ...	99°	96°	86°	10th do.
4 P. M. ...	97°	95°	87°	

Time.		Ring Room. No Ventilator or Humidifier.	Mule Room. Hart's Ventilator and Humidifier Working	Outside Temperature in the Shade.	Month and Date
10 A. M.	...	98°	94°	84°	11th August 1906.
4 P. M.	...	97°	95°	87°	
10 A. M.	...	97°	94°	86°	13th do.
4 P. M.	...	96°	95°	86°	
10 A. M.	...	98°	95°	87°	14th do.
4 P. M.	...	97°	96°	88°	
10 A. M.	...	99°	96°	86°	15th do.
4 P. M.	...	98°	98°	87°	
10 A. M.	...	101°	97°	86°	16th do.
4 P. M.	...	102°	98°	87°	
10 A. M.	...	100°	98°	86°	17th do.
4 P. M.	...	102°	99°	86°	
10 A. M.	...	101°	98°	84°	18th do.
4 P. M.	...	103°	98°	86°	
10 A. M.	...	102°	97°	82°	20th do.
4 P. M.	...	100°	98°	85°	
10 A. M.	...	102°	99°	84°	21st do.
4 P. M.	...	102°	99°	84°	
10 A. M.	...	104°	98°	82°	22nd do.
4 P. M.	...	103°	99°	84°	
10 A. M.	...	98°	95°	85°	24th do.
4 P. M.	...	99°	95°	87°	
10 A. M.	...	100°	97°	82°	25th do.
4 P. M.	...	99°	98°	81°	
10 A. M.	...	100°	95°	80°	26th do.
4 P. M.	...	100°	94°	80°	
10 A. M.	...	98°	94°	83°	27th do.
4 P. M.	...	99°	94°	84°	
10 A. M.	...	99°	94°	81°	28th do.
4 P. M.	...	98°	95°	83°	
10 A. M.	...	98°	94°	85°	29th do.
4 P. M.	...	100°	95°	86°	
10 A. M.	...	97°	95°	85°	31st do.
4 P. M.	...	95°	95°	86°	
10 A. M.	...	97°	93°	86°	1st September 1906
4 P. M.	...	98°	98°	86°	
10 A. M.	...	95°	94°	85°	3rd do.
4 P. M.	...	96°	94°	85°	
10 A. M.	...	96°	96°	85°	4th do.
4 P. M.	...	96°	95°	85°	
10 A. M.	...	98°	96°	85°	5th do.
4 P. M.	...	98°	96°	85°	
10 A. M.	...	98°	95°	85°	6th do.
4 P. M.	...	94°	93°	84°	

Time.		Ring Room. No Ventilator or Humidifier.	Mule Room. Hart's Ventilator and Humidifier Working.	Outside Temperature in the Shade.	Month and Date.
10 A. M.	...	95°	94°	83°	7th September 1906.
4 P. M.	...	97°	96°	82°	
10 A. M.	...	97°	95°	85°	8th do.
4 P. M.	...	96°	95°	86°	
10 A. M.	...	96°	93°	85°	10th do.
4 P. M.	...	95°	95°	86°	
10 A. M.	...	96°	94°	85°	11th do.
4 P. M.	...	95°	94°	84°	
10 A. M.	...	96°	94°	85°	12th do.
4 P. M.	...	97°	95°	84°	
10 A. M.	...	98°	93°	84°	13th do.
4 P. M.	...	93°	94°	85°	
10 A. M.	...	97°	93°	85°	14th do.
4 P. M.	...	95°	94°	86°	
10 A. M.	...	97°	95°	86°	15th do.
4 P. M.	...	95°	93°	86°	
10 A. M.	...	96°	96°	85°	16th do.
4 P. M.	...	96°	95°	86°	
10 A. M.	...	99°	97°	85°	17th do.
4 P. M.	...	96°	95°	86°	
10 A. M.	...	98°	93°	86°	19th do.
4 P. M.	...	96°	94°	86°	
10 A. M.	...	99°	97°	87°	20th do.
4 P. M.	...	101°	98°	87°	
10 A. M.	...	100°	98°	82°	21st do.
4 P. M.	...	96°	95°	84°	
10 A. M.	...	101°	97°	83°	22nd do.
4 P. M.	...	101°	97°	84°	
10 A. M.	...	99°	95°	83°	24th do.
4 P. M.	...	99°	97°	84°	
10 A. M.	...	101°	98°	84°	25th do.
4 P. M.	...	100°	98°	84°	
10 A. M.	...	98°	96°	85°	26th do.
4 P. M.	...	99°	96°	85°	
10 A. M.	...	99°	95°	86°	28th do.
4 P. M.	...	98°	96°	85°	
10 A. M.	...	98°	96°	85°	29th do.
4 P. M.	...	98°	96°	85°	
10 A. M.	...	98°	96°	86°	30th do.
4 P. M.	...	98°	95°	86°	
10 A. M.	...	98°	95°	86°	1st October 1906.
4 P. M.	...	98°	95°	86°	
10 A. M.	...	99°	96°	85°	2nd do.
4 P. M.	...	98°	96°	86°	

Time.	Ring Room. No Ventilator or Humidifier.	Mule Room. Hart's Ventilator and Humidifier working.	Outside Temperature in the shade.	Month and Date.
10 A.M. ...	98°	95°	86°	3rd October 1906.
4 P.M. ...	93°	95°	86°	
10 A.M. ...	99°	96°	86°	4th do.
4 P.M. ...	98°	95°	86°	
10 A.M. ...	98°	95°	87°	5th do.
4 P.M. ...	98°	95°	87°	
10 A.M. ...	99°	96°	87°	6th do.
4 P.M. ...	98°	95°	87°	
10 A.M. ...	100°	96°	85°	8th do.
4 P.M. ...	98°	95°	86°	
10 A.M. ...	101°	96°	86°	9th do.
4 P.M. ...	100°	96°	86°	
10 A.M. ...	99°	98°	87°	10th do.
4 P.M. ...	98°	96°	87°	
10 A.M. ...	100°	98°	87°	11th do.
4 P.M. ...	102°	99°	87°	
10 A.M. ...	98°	97°	86°	12th do.
4 P.M. ...	99°	96°	87°	
10 A.M. ...	102°	97°	87°	13th do.
4 P.M. ...	103°	98°	88°	
10 A.M. ...	99°	96°	87°	14th do.
4 P.M. ...	100°	97°	87°	
10 A.M. ...	98°	96°	87°	15th do.
4 P.M. ...	102°	98°	86°	
10 A.M. ...	95°	95°	87°	16th do.
4 P.M. ...	102°	98°	88°	
10 A.M. ...	96°	93°	87°	20th do.
4 P.M. ...	100°	97°	86°	
10 A.M. ...	95°	91°	86°	21st do.
4 P.M. ...	101°	99°	87°	
10 A.M. ...	97°	96°	85°	22nd do.
4 P.M. ...	103°	100°	86°	
10 A.M. ...	93°	94°	85°	23rd do.
4 P.M. ..	101°	98°	86°	
10 A.M. ...	101°	96°	84°	24th do.
4 P.M. ...	105°	100°	86°	
10 A.M. ...	100°	97°	85°	25th do.
4 P.M. ...	104°	101°	87°	
10 A.M. ...	98°	97°	84°	26th do.
4 P.M. ...	102°	100°	86°	
10 A.M. ...	100°	97°	84°	27th do.
4 P.M. ...	104°	100°	86°	
10 A.M. ...	97°	95°	85°	29th do.
4 P.M. ...	102°	98°	86°	

Time.		Ring Room. No Ventilator or Humidifier.	Mule Room. Hart's Ventilator and Humidifier working.	Out side Temperature in the shade.	Month and Date.
10 A.M.	...	99°	95°	85°	30th October 1906.
4 P.M.	...	102°	99°	85°	
10 A.M.	...	99°	96°	84°	31st do.
4 P.M.	...	102°	98°	86°	
10 A.M.	...	101°	98°	85°	1st November 1906.
4 P.M.	...	102°	99°	86°	
10 A.M.	...	101°	98°	85°	2nd do.
4 P.M.	...	102°	100°	86°	
10 A.M.	...	100°	97°	85°	3rd do.
4 P.M.	...	102°	99°	86°	
10 A.M.	...	99°	97°	86°	5th do.
4 P.M.	...	101°	99°	85°	
10 A.M.	...	100°	97°	86°	6th do.
4 P.M.	...	103°	100°	85°	
10 A.M.	...	100°	97°	85°	7th do.
4 P.M.	...	103°	99°	86°	
10 A.M.	...	99°	93°	85°	8th do.
4 P.M.	...	102°	100°	86°	
10 A.M.	...	98°	96°	85°	9th do.
4 P.M.	...	99°	98°	86°	
10 A.M.	..	99°	96°	84°	10th do.
4 P.M.	...	102°	99°	85°	
10 A.M.	...	97°	95°	83°	12th do.
4 P.M.	...	101°	98°	85°	
10 A.M.	...	98°	96°	83°	13th do.
4 P.M.	...	103°	100°	85°	
10 A.M.	...	101°	97°	85°	14th do.
4 P.M.	...	105°	100°	86°	
10 A.M.	...	100°	96°	85°	15th do.
4 P.M.	...	104°	100°	85°	
10 A.M.	...	99°	97°	84°	16th do.
4 P.M.	...	105°	100°	85°	
10 A.M.	...	101°	97°	84°	17th do.
4 P.M.	...	102°	100°	86°	
10 A.M.	...	100°	96°	83°	19th do.
4 P.M.	...	102°	98°	85°	
10 A.M.	...	98°	96°	84°	20th do.
4 P.M.	...	103°	98°	84°	
10 A.M.	...	99°	97°	84°	21st do.
4 P.M.	...	103°	99°	85°	
10 A.M.	...	100°	96°	85°	22nd do.
4 P.M.	...	104°	98°	86°	
10 A.M.	...	102°	97°	84°	23rd do.
4 P.M.	...	104°	100°	86°	

Time.		Ring Room. No Ventilator or Humidifier.	Mule Room. Hart's Ventilator and Humidifier working	Outside Temparature in the shade.	Month and Date.
10 A. M.	...	102°	98°	85°	24th November 1906.
4 P. M.	...	100°	99°	86°	
10 A. M.	...	99°	96°	85°	26th do.
4 P. M.	...	104°	100°	86°	
10 A. M.	...	101°	97°	82°	27th do.
4 P. M.	...	105°	101°	83°	
10 A. M.	...	100°	96°	84°	28th do.
4 P. M.	...	105°	100°	85°	
10 A. M.	...	100°	96°	80°	29th do.
4 P. M.	...	103°	99°	83°	
10 A. M.	..	100°	94°	79°	30th do.
4 P. M.	...	105°	99°	82°	
10 A. M.	...	100°	95°	79°	1st December 190
4 P. M.	...	97°	93°	80°	
10 A. M.	...	98°	95°	78°	3rd do.
4 P. M.	..	100°	98°	81°	
10 A. M.	...	98°	96°	80°	4th do.
4 P. M.	...	100°	97°	82°	
10 A. M.	...	98°	94°	78°	5th do.
4 P. M.	...	99°	96°	81°	
10 A. M.	...	99°	93°	83°	10th do.
4 P. M.	...	102°	97°	84°	
10 A. M.	...	98°	93°	82°	11th do.
4 P. M.	...	103°	96°	83°	
10 A. M.	...	99°	93°	78°	12th do.
4 P. M.	...	101°	96°	81°	
10 A. M.	...	99°	94°	79°	13th do.
4 P. M.	...	101°	97°	80°	
10 A. M.	...	98°	95°	79°	14th do.
4 P. M.	...	102°	99°	81°	
10 A. M.	...	98°	94°	78°	15th do
4 P. M.	...	102°	97°	81°	
10 A. M.	...	99°	94°	78°	17th do.
4 P. M.	...	102°	97°	78°	
10 A. M.	...	100°	95°	78°	18th do.
4 P. M.	...	103°	98°	78°	
10 A. M.	...	100°	96°	76°	19th do.
4 P. M.	..	103°	98°	78°	
10 A. M.	...	100°	96°	76°	20th do.
4 P. M.	...	103°	99°	79°	
10 A. M.	...	101°	97°	78°	21st do.
4 P. M.	...	104°	100°	80°	
10 A. M.	...	101°	97°	80°	22nd do.
4 P. M.	...	104°	99°	80°	

Time.		Ring Room. No Ventilator or Humidifier.	Mule Room. Hart's Ventilator and Humidifier working.	Outside Temperature in the shade.	Month and Date.
10 A. M.	...	98°	95°	79°	24th December 1906.
4 P. M.	..	101°	97°	80°	
10 A. M.	...	100°	95°	79°	25th do.
4 P. M.	...	102°	98°	81°	
10 A. M.	...	100°	95°	80°	26th do.
4 P. M.	...	105°	98°	81°	
10 A. M.	..	100°	94°	78°	27th do.
4 P. M.	...	105°	98°	81°	
10 A. M.	...	101°	94°	78°	28th do.
4 P. M.	...	105°	98°	81°	
10 A. M.	...	101°	95°	79°	29th do.
4 P. M.	...	100°	98°	81°	
10 A. M.	...	101°	96°	80°	30th do.
4 P. M.	...	97°	98°	82°	
10 A. M.	...	102°	97°	80°	31st do.
4 P. M.	...	103°	100°	81°	
10 A. M.	...	102°	97°	82°	1st January 1907.
4 P. M.	...	103°	99°	84°	
10 A. M.	...	98°	95°	79°	4th do.
4 P. M.	...	101°	97°	81°	
10 A. M.	...	99°	94°	79°	5th do.
4 P. M.	...	103°	98°	82°	
10 A. M.	...	101°	95°	81°	6th do.
4 P. M.	...	103°	97°	82°	
10 A. M.	...	100°	95°	79°	7th do.
4 P. M.	...	101°	95°	81°	
10 A. M.	...	102°	96°	77°	8th do.
4 P. M.	...	102°	97°	78°	

APPENDIX B

PARTICULARS SHOWING THE NUMBER OF WORKERS EMPLOYED ON DIFFERENT MACHINES IN MILLS

IN

INDIA AND GREAT BRITAIN.

THE MANOCKJEE PETIT MANUFACTURING COMPANY, LIMITED.

Mills, Tardeo.

Bombay, 7th January 1907.

Average daily number of operatives employed ... 2,455 male adults. 810 female adults. *118 male children. 87 female children.

* Half-timers working in shifts as required by the Factories Act.

Mixing Room and Blow Room Department.

Mixing feeder :—One male on each machine.

One male on each exhaust opener.

Two males on each lap machine when cotton is fed by hand.

One male on each Scutcher lap machine.

One male on each finisher lap machine.

One male on each Willow machine.

Besides these hands, there are in this Department Lap Weighers, Dust Carriers, Dropping Carriers, Seed Cleaners, Sweepers, Spare Hands, Thread Extractors, Mixing Breakers, Cotton Carriers (in all 51 hands).

Carding Engines.

One pair of Grinders to strip from 14 to 18 Cards.

One Card Tenter to mind 8 cards.

One Lap Carrier to supply Laps on 18 Carding Engines.

Ten persons to carry Fly, Waste, Sweeping, &c.

Three Drawing Tenters on each of the Drawings with 3 Heads, each of 5 to 8 deliveries.

One Slubbing Tenter on a Frame of 80 Spindles.

One Intermediate Frame Tenter on a Frame of 124 Spindles.

One Roving Frame Tenter on a Frame of 160 Spindles.

24 Sweepers, Waste Carriers, &c., to carry sweepings, &c., of the above frames.

181 Doffer Boys to Doff full bobbins of slubbing Intermediate and Roving Frames.

80 Persons as Roller Coverers, Fitters, Carpenters, Mochies, &c.

Ring Frames.

Two Side Boys to mind a frame of from 264 to 348 Spindles.

240 Followers to look after 218 Ring Frames.

170 Doffer Boys half timers.

130 Doffer Boys full timers to doff bobbins of 218 Frames.

157 Bobbin Carriers, Waste Carriers, Creelers, Oilers and extra hands such as Rollers Coverers, Fitters, Carpenters, Jobbers, Yarn Weighers, Mochis, Bandingwalla, Cotton Pickers, &c., &c.

Reeling Department.

A pair of Reelers on each Reel, giving on an average 50 lbs. of yarn of 20's standard or 120 lbs. of yarn of 10's standard per day.

Yarn Bundling Department.

This Department consists of 30 persons, bundling on an average 1,100 bundles, each of 10 lbs., per day.

Baling Department.

20 men baling on an average 11,500 lbs. of yarn and 12,300 lbs. of cloth per day.

Warping Department.

A pair of Winders wind up 80 lbs. of yarn of 20's standard.

One Drum and Pirn Winder winds up 25 lbs. of coloured yarn of 20's standard.

One Warper and one Creeler on each Warping Machine.

One Sizer and one Back Sizer on every Sizing Machine.

One Beam Drawer with a Reacher draws in about 3,000 ends per day.

45 Extra Hands to carry Beams, Weft Bobbins, Rubbish, Waste, Finished Cloth, &c., to their respective destination.

One man attends two Looms at a time up to 58" in width. Jacquard Looms and Looms over 58" in width have one man on each of them.

This List does not include Headmen, Clerks, Jobbers and other odd hands engaged in the Mill.

GANGES MANUFACTURING COMPANY, LIMITED.

Seebpore, 24th January 1907.

Particulars giving Number of Workers engaged at the different machines from Batching to Cloth Finishing.

Name of Machine.	Workers employed.		Remarks
	Women.	Men.	
Jute Softener Feed end	...	2	Daily worker.
Do. Delivery do.	2	...	Do.
Breaker card Feed do.	2	...	Do.
Do. Delivery do.	1	...	Do.
Finisher card Feed do.	1	...	Do.
Do. Delivery do.	1	.	Do.
First Drawing Frame Feed end	1	...	Do.
Do. do. Delivery do.	1	...	Do.
Second do. Feed do.	1	...	Do.
Do. do. Delivery do.	1	...	Do.
Roving Frame for Sacking Weft Feed end ..	2	...	Do.
Do. do. Delivery do. ...	...	1	Do.
Do. for Warps and Hessian Wefts Feed end ...	1		Do.
Do. do. Delivery end ..	...	1	Do.

Name of Machine.	Workers employed	Remarks
Doffing Roving Bobbins Sacking Weft	One man doffs 6 Bobbins of 8 Roving Frames	Daily worker.
Do. Bobbins Warps ...	One man doffs 6 Bobbins of 10 Roving Frames	Do.
Spinning Frame Sacking Weft ...	One man tends 33 Spindles ...	Do.
Do. Sacking Warp and Hessian Wefts	Do. 60 do. ..	Do.
Spinning Frame Hessian Warps ...	Do. 90 do ...	Do.
Doffing Spinning Bobbins Sacking Weft quality.	One man doffs 6 Bobbins of 12 Spinning Frames.	Do.
Doffing Spinning Bobbins Warp and Hessian Weft quality.	One boy or girl doffs 6 Bobbins of 13 Spinning Frames.	Do.
Cop Winding Machine Hessian Wefts	One man tends 16 Spindles ...	Piece-work.
Do do. Sacking Weft .	Do. 10 do. .	Do.
Warp Winding Machine Bobbins ...	One woman tends 9 do. ...	Do.
Do. Spools ...	One man tends 10 do. ...	Do.
Dry Beaming Machines ...	Five men at each machine ...	Daily worker.
Dressing Machines	Do. do.	Do.
Loom	One man at each	Piece-work.
Calender Machine	Five men at each machine ...	Daily worker.

In addition to foregoing, to cope with workers absenting themselves from work, which they often do, and to relieve workers for their half hour's rest, a number of spare workers equal to 12 per cent. of the total are employed.

THE GOUREPORE COMPANY, LIMITED, GOUREPORE, 24-PARGANAS.

List of Hands employed in various Departments in No. 2 Mill.

			Hands.
1.		Selecters	54
2.		Root Cutters	125
3.	12	Softeners	132
4.	24	Breakers	91
5.	35	Finishers	205
6.	28	1st Drawings	84
7.	28	2nd Drawings	160
8.	29	Rovings of 64 Spindles	192
9.	85½	Pairs of Spinning Frames 80 Spindles aside.	289 Spinners.
			580 Shifters.
			180 Coolies, Sirdars and Oilers.
10.	13	Pairs of Roll-Winders	110 Winders.
			50 Bobbin boys, Coolies and Sirdars.
11.	14	Pairs of Cop-Winders	140 Winders.
			60 Bobbin boys, Coolies and Sirdars.
12.	16	Dressing Machine.	120
13.		Looms	840
			100 Sirdars, Coolies, Oilers and Sweepers.
14.	2	Mangle	10
15.	11	Calenders	50
16.	9	Lapping Machines	32
17.	10	Croppers	16
18.	5	Hydraulic packing presses ...	40
19.	4	Sets of pumps	9

THE MUIR MILLS COMPANY, LIMITED.

Cawnpore, 5th March 1907.

Flat Cards. 6 hands per 10 cards.
Roller „ 3¾ „ „ „ „
Drawing Frames of 3 heads each —2·4 hands.
Shuttling Frames of 84 spindles — 2 „
Intermediate Frames of 114 spindles 2 „
Roving Frames of 144 spindles — 2·2 „
Mules 5·77 hand per 1,000 spindles.
Rings 17·28 „ „ „ „
40 bank reels—1·06 hands per reel.
Looms—285 1 hand each.
„ 966 1 hand to two looms.

JOHNS' MILLS—AGRA.

Machine	Description of Machine.	Number of Workmen	Daily earnings, each	Remarks
Cotton Opener ...	Double brighton ..	(4) Four ...	Four annas.	
Scutcher ..	Single Scutcher ...	(1) One to each ...	Five annas	
Cards ...	Roller and clearers 40"	(9) Nine to each 20 cards.	See remark (a) ..	(a) Grinders get 4½ annas, Strippers 4 annas, Sweepers, can carriers and lap carriers 3½ annas per day.
Drawing ...	3 Heads of 6 Deliveries.	(1) One to each Head.	Seven and a half annas	
Slubbing ...	84 Spindles...	(1) One	Nine annas	
Intermediate ..	100 "	(1) One ...	Eight and a half annas	
Rovers	128 " ...	(1) One	Six annas.	
Mules	636=1,272 Spindles.	(8) Eight	See remarks (b) ...	(b) Menders get 1 rupee, 1st Class Piecers, 6 annas, 2nd Class Piecers, 4½ annas.
Reeling	40 Hanks	(1) One	Five and a half annas	The absent list is about 17 per cent. daily. The Mills employ — Agra S. & W. ... 5[illegible]5 Johns S. W. 63[illegible] Coronation S. W 4[illegible]6 Total ..1,70[illegible]

Particulars giving Number of Workers in Jute Mills engaged at the different Machines from Batching to Cloth Finishing, in Dundee.

Name of Machine.	Workers employed.	Remarks.
Jute Softner Feed end	3 women and 1 man but sometimes 4 men.	
Do. Delivery end... ...	3 men who take off and other 3 men carry away.	
Breaker Card Feed end	2 women	
Do. Delivery end ...	1 woman or 1 man.	
Finisher Card Feed end	1 woman for 2 machines	
Do Delivery	1 woman for 2 machines	
First Drawing Frame Feed end ...	1 woman.	
Do. do. Delivery end.	1 woman.	
Second do. Feed end ...	1 woman.	
Do do. Delivery end.	1 woman.	
Roving Frame for Sacking Weft Feed end	1 woman.	
Roving Frame for Sacking Weft Delivery end.	1 woman, sometimes 1 woman attends to 2 machines.	
Roving Frame for Warfs and Hessian Wefts Feed end	1 woman.	
Roving Frame for Warfs and Hessian Wefts delivery.	1 woman, sometimes 1 woman attends to 2 machines.	
Doffing Roving Bobbins Sacking Weft.	4 women and 4 boys to 7 machines	
Doffing Roving Bobbins Warps ..	4 women and 4 boys to 7 machines.	
Spinning Frame Sacking Weft ...	1 spinner per frame of 60 spindles.	
Spinning Frame Sacking Warp and Hessian Wefts.	1 spinner per frame of 60 spindles.	
Spinning Frame Hessian Warps ..	1 spinner per frame of 60 spindles.	
Doffing Spinning Bobbins Sacking Weft quality.	20 workers for 15 frames of 60 spindles.	
Doffing Spinning Bobbins Warp and Hessian Weft quality.	20 workers for 24 frames of 60 spindles.	
Cop Winding Machine Hessian Wefts.	6 women, 3 on each side.	
Cop Winding Machine Sacking Weft	6 women, 3 on each side.	
Warp Winding Machine Bobbins ..	6 women, 3 on each side.	
Warp Winding Machine Spools ..	6 women, 3 on each side.	
Dry Beaming Machines	1 man and 1 boy.	
Dressing Machines	1 man and 1 boy.	
Loom	1 woman attends to two looms except in the cases of sacking and Hessians over 60" wide when she attends to 1 loom only.	
Calender Machine	4 men attend to 2 calendering machines	

Cotton Spinning—Lancashire.

It is calculated that at a modern Lancashire Mill, 2½ to 3 persons are employed to every 1,000 self-acting Mule Spindles.

At such a Mill of 80,000 Spindles, the weekly output of Yarn, 50s counts American Cotton, would be 35,000 lbs. to. 40,000 lbs.

This quantity would about supply a Weaving Shed of 1,000 looms, it being calculated that one loom works up about 35 lbs. Yarn per week for ordinary classes of cloth.

The machines and classes and numbers of workers employed, and the wages paid in such a Mill and Shed would average as follows:—

"D" denotes Day wage and "P" Piece wage.

Cotton and Mixing Room—				
2 Bale-breaking machines ...	2 men at 29 per week D, with the occasional assistance of the Wasteman.			
Blowing Room—				
2 Exhaust cotton opening Machines and 4 finishing Scutch Machines.	2 Men at 32 per week			... D.
	1 Male y. p. 13 ,, ...			... D.
Card Room—				
90 Flat Carding Engines ...	6 Men, Strippers and grinders at	28 to 32	per week	... D.
	1 Man Carder	35 to 38	,,	... D.
	4 Females y. p. and woman tenters	10/6	,,	... P.
10 Drawing Frames	10 Women ,,	20	,,	... P.
10 Slubbing ,, ...	5 ,, ,,	20	,,	... P.
	5 Female y. p. back ,,	8/6 to 10	,,	... P.
24 Intermediate ,, ...	12 Women ,,	21	,,	... P.
	6 Female y. p. back ,,	8/6 to 10	,,	... P.
46 Roving or "Jack" frames .	23 Women ,,	21	,,	... P.
	8 Female y. p. back ,,	8/6 to 10	,,	...
	1 Bobbin and 1 yarn carrier ,,	10	,,	... D.
	1 Under Carder ,,	20 to 25	,,	... D.
	1 Frame man			... ...
Mule Rooms—				
36 Pairs of S. A. Mules of 1,120 spindles each.	36 Men, Minders at	35 to 45	,,	... P.
	36 Young men, Big Piecers at	17 to 20	,,	... D.
	36 Male y. p. and children little	11 to 14	,,	... D.
	1 Overlooker	55	,,	... D.
Warehouse	1 Clerk ..., 4 Packers ..., 1 Wasteman. — all men at about	20	,,	... D.
Other Departments	1 Engine Driver, 2 Firemen and 1 Mechanic and apprentice, 1 Oiler, 1 Joiner, 1 Roller Coverer and girl helper, 2 Clerks, 1 Inside Foreman, 1 Salesman and 1 Cashier and a Manager = 14 at a total of about £ 23 per week.			

This makes a total of 218 persons employed.

Cotton Weaving.

		Per week.	
Preparatory Rooms	60 Female y. p. and woman Winders at	15 to 20 ...	Piece-work is the rule.
	11 Women, Beamers ,,	15 to 20 ...	
	4 Men, Slashers and Sizers ,,	20 to 30 ...	
	2 Women and female y. p., Drawers ,,	15 to 20 ...	
	6 ,, ,, ,, Twisters ,,	15 to 20 ...	
Weaving shed, 2, 3 and 4 looms each, Learners, 1 loom.	300 men, male and female y. ps. and women, weavers with children ("Chittys") as learners	9 to 21 ...	
Generally, one "Tackler" to 80 looms.	12 to 14 men, Overlookers or "Tacklers". Their wages are calculated proportionately to the earnings of the weavers under them	42	
Other Departments	Outlookers, Assistants, cloth pressers, Engine Driver, Fireman, Mechanic and helper, Inside Foreman and Manager—making a total of upwards of 400 persons employed, the usual scale being 2 to 2½ looms to each person, including preparatory processes.		

Bleaching, Dyeing, Finishing and Making up.

		Per week.	
Croft and Dyehouse	Bleachers, male y. ps.	10 to 20 ...	Day and piece-rates paid.
	" Men	25 to 35 ...	
	Crofters and Stenterers, men.	32 to 36 ...	
	Stenterers, Women	16 to 21 ..	
	Dyers, men	32 to 36 ...	
Warehouse	Makers y. p. Women	16 to 25 ...	
	Stitchers, Ribboners, Plaiters and Hookers, Females y. ps. and women	11 to 16 ...	

The following tables are from a pamphlet entitled "Cotton Mill Labour in India" by a Mill Manager. The Committee have not been able to verify the statements in detail, but the author is known to them. He is generally considered a reliable authority, and it is thought that his tables should be published.

Table giving a Synoptical view of the Comparative Statements relating to Spinners in England and India.

	England	India.
1 Operatives per 1,000 spindles	4·2	28
2. Number of times Indian hands employed for a given unit to English	1	6·6
3 [illegible] ...	3·7	21
4 [illegible]	1	5·67
5. [illegible]	2 5	17
6 [illegible] ..	1	6·8
7. [illegible]	6	32
8 [illegible]	1	5 3
9 [illegible] ...	lbs. 7,736	4,000
10. [illegible] ...	lbs. 32·6	112
11. Hourly production per spindle	oz. ·18	·43
12. Indian weight to English per hour per spindle	1	2 2
13. Production per 1,000 spindles per hour	lbs. 11 25	25·62
14 Average approximate counts	40s.	20s.
15. Length of yarn turned out per hour	Yds. 378	430
16. Indian length to English	1	1·2
17. Working days in the year	300	309
18. Working weeks in the year	50	51½
19. Working hours per week	55½	80
20. Do. per year	2,775	4,120
21. Number of times Indian working hours to English ..	1	1 48
22. Monthly wages per operative	Rs 70	13
23. Annual wages do.	Rs. 840	156
24. Payment per operative per hour	Pies 58	7·2
25. Do. per 1,000 spindles monthly ..	Rs. 291	364
26. Payment per 1,000 spindles per hour	Annas 20 3	16·8
27. Number of times English hourly wages to Indians per operative.	8	1

Table giving a Comparative Statement of the English and Indian Weavers.

	England.	India.
1. Hands employed per loom	·43	1¼
2. Length turned out per loom annually	Yds. 16,500	15,450
3. Do. do. weekly	Yds 330	300
4. Do. do. hourly	5 94	3·75
5. Proportion of English yards turned out to Indian hourly ...	1·58	1
6. Weight turned out per loom yearly	lbs. 3,900	4,120
7. Do. do. weekly	78	80
8. Do. do. hourly	1·4	1
9. Length turned out per operative per week	Yds 767	240
10 Proportion of length turned out per operative per week in England and India	3·11	1
11. Weight per operative per week	lbs. 181	64
12. Proportion of weight per operative per week in England and India	2·82	1
13. Monthly wages per operative	Rs. 72	15

APPENDIX C.

JAPANESE TEXTILE INDUSTRIES.

A.—Classification of Operatives by Age and Sex.

(The figures in the following Table are extracted from the "Financial and Economic Annual of Japan", [illegible], issued by the Japanese Department of Finance.)

	Above 14 years of age		Under 14 years of age		Total.		
	Males.	Females.	Males.	Females.	Males.	Females.	Total.
Raw Silk	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Spinning	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Weaving	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Dyeing and Bleaching	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total Textile	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

No accurate statement as to the age of the majority of operatives employed in every kind of workshops can easily be obtained, but broadly stated the greater part of operatives in factory industries are females of 15 to 25 years of age, the number of those from 25 to [illegible] coming next. Even the youngest are very rarely below 12 or 13. In raw silk, females of from 15 to 20 constitute 30 per cent., those above 20 about 40 per cent., and those below 15 about 20 per cent. of the total number of operatives employed. In spinning mills also girls below 15 constitute a little over 20 per cent. of the whole number, those from 15 to 20 about 30, and those above about 50 per cent., of whom the majority are of 20 to 25 years old. The female operatives in weaving factories do not differ from those of spinning mills in regard to the age ratio, and those in [illegible] are similar to those in factories.*

B.—Average Daily Wages.

The following figures are extracted from the "Financial and Economic Annual of Japan", [illegible], issued by the Japanese Department of Finance.

		[illegible]	[illegible]	[illegible]
		Sen.	Sen.	Sen.
Raw Silk Operatives	Males over 15 years	...	...	[illegible]
	Females over 15 years ...	Not given		[illegible]
	Males under 15 years	...	...	[illegible]
	Females under 15 years	...	...	[illegible]
Silk Spinners	Females	[illegible]	[illegible]	[illegible]
Cotton Spinning Mill Workpeople	Males	[illegible]	[illegible]	[illegible]
	Females	[illegible]	[illegible]	[illegible]
Weavers (material of all kinds)	Males	[illegible]	[illegible]	[illegible]
	Females	[illegible]	[illegible]	[illegible]

C.—[illegible]

In "Japan at the beginning of the 20th Century" it is stated that, in [illegible], in Cotton Mills [illegible] per cent. of the workpeople worked on time wages, and [illegible] per cent. on piecewages, which was growing in favour.

D.—Working Hours (1902).

In cotton mills 12 hours are standard, both for day and night workers, they being made to take day and night work by turns every two weeks. In factories the regulation hours are [illegible] to [illegible], on an average about [illegible]. But in [illegible] workshops a great diversity prevails, the general rule being [illegible] to [illegible], according to the season, though in some rare cases the hours are as long as [illegible] or [illegible].*

*"Japan at the beginning of the 20th Century."

* This is quoted from "Japan in the beginning of the 20th Century", published by the "Imperial Japanese Commission to the Louisiana Purchase Exhibition" in [illegible].

APPENDIX D.

Statement showing the Mills inspected by the Factory Labour Committee appointed under the Resolution issued by the Government of India, Department of Commerce and Industry, Nos. 9974-9975-13, dated 17th December 1906.

1	2	3	4
Serial No.	Name of Work.	Date of Inspection	What Work is carried on
	Bombay.		
1	The Manokji Petit Mills	24th December 1906.	Cotton spinning and weaving.
2	Messrs. Geo. Gahagan and Company's Factory, Bellasis Road.	Do. ...	Iron foundry.
3	The New Great Eastern Spinning and Weav- [illegible]	26th December 1906	Spinning and weaving.
4	[illegible] ...	Do. ..	Silk weaving.
5	[illegible] m-	27th December 1906.	Spinning and weaving.
6	[illegible] ...	Do. ...	Preparation of paper.
7	Colaba Land and Mill Company's Mills, Colaba	28th December 1906	Cotton spinning and weaving.
8	Jehangir Wadia Spinning Mill	Do ...	Cotton spinning.
9	The Bombay Cotton Pressing and Cleaning Company.	Do. ..	Cleaning and pressing of cotton and other textile fibres
10	The Indian Mill, Ripon Road	30th December 1906.	Cotton spinning and weaving.
11	Jam Manufacturing Company's Mill at Sopari-bag	31st December 1906	Do.
12	Kaisir-i-Hind Spinning and Weaving ..	Do. ...	Do.
13	The New Kaisir-i-Hind Mill, Gorupdeo Road...	1st January 1907.	Do.
14	Works of the Mahadeo Dharmsey Manufacturing Company, Limited, on Foras Road.	2nd January 1907.	Do.
15	Horshead Manufacturing Company's Cotton Mill.	Do. ...	Cotton spinning, cleaning and carding.
16	Works occupied by the David Mill Company ..	3rd January 1907.	Spinning and weaving of cotton.
17	Karreembhoy Mill, Parel	Do. ...	Cotton spinning
18	Crown Spinning and Weaving Company's Works, Elphinstone Road.	Do. ..	Cotton spinning and weaving
19	Framji Petit Spinning and Weaving Company's Mills.	4th January 1907	Do
20	The Akbar-i-Islam Manufacturing and Pressing Company, Limited.	Do. ...	Cleaning and pressing of wool, cotton, hemp and jute
21	The Alliance Cotton Manufacturing Mill ..	6th January 1906.	Cotton spinning and weaving.
22	Jivraj Balloo Spinning and Weaving Company Mill.	Do. ...	Do.
23-24	David Mill Company's Mills (old and new) ...	7th January 1907.	Do.
25	Bombay Woollen Manufacturing Company's Works at Dadar.	8th January 1907.	Wool spinning and weaving.
26	Sorab Hormasji Cotton Manufacturing Company's Mill.	Do. ...	Cotton spinning.
27	Wool Sorting Works occupied by Salih Mahomed Virji, Surti Street.	9th January 1907.	Spinning and sorting of fleeces.
28	Wool Sorting Works of Bhow Anji Luchmidas Harabab,	Do. ...	Sorting of wool.
29	Carpet Hand-loom factory occupied by Ebrahim Haaroon and several other similar places.	Do. ...	Hand-loom carpet making
30	Cotton and Woollen Factory of Messrs. Hassanally Sulimanji.	Do. ...	Cotton and Woollen Factory.
31	Works of the Khatau Makanji Spinning and Weaving Company, Limited.	10th January 1907.	Cotton spinning and weaving.
32	The Bombay United Spinning and Weaving Mill, Charni Road.	Do. ...	Do.

1	2	3	4
Serial No.	Name of Work.	Date of Inspection.	What Work is carried on.
	Madras.		
61	The Carnaatic Mills	6th February 1907.	Spinning and weaving.
62	The Madras United Spinning and Weaving Company's Works.	7th February 1907.	Spinning and weaving (no weaving is carried on at present).
63	The Buckingham Mills	7th February 1907.	Spinning and weaving.
64-65	The New Madras Spinning and Weaving Mills of Messrs. Ramji Lachmidas (2 mills).	8th February 1907.	Spinning and weaving.
66	The Central Barrel Press	Do. ...	Ginning and cleaning of textile raw materials.
	Bengal.		
67	Works of the Union Jute Company ...	13th February 1907.	Jute spinning and weaving.
68	Messers. Guzdar and Company's Victoria Cotton Mills, Ghoosary.	14th February 1907.	Preparation and ring spinning of cotton.
69	Messrs. Andrew Yule's Central Jute Mill ...	Do. ...	Jute spinning and weaving.
70	Messrs. Horton and Company's Rope Works ...	15th February 1907.	Hemp spinning and manufacture of ropes.
71	Messrs. Andrew Yule Company's Ghoosary Cotton Mills.	Do. ...	Cotton spinning.
72	Naysmith's Patent Press Company ...	Do. ...	Initial processes in the manufacture of hemp and jute.
	Delhi.		
73	The Krishna Mills Company, Limited ..	18th February 1907.	Cotton spinning.
74	The Delhi Cotton and General Mills Company, Limited.	Do. ..	Ring and mule spinning and weaving (cotton).
75	The Ginning Mill belonging to the same Company as No. 74.	Do. ...	Ginning of cotton.
76	Goela Ginning Mill	19th February 1907.	Do.
77	The Jumna Mill owned by Saran and Company	Do. ...	Spinning.
78	The Victoria Cotton Ginning Mill ...	Do. ...	Cotton ginning
79	The Hanuman and Mahadeo Spinhing and Weaving Mill.	Do. ..	Spinning and weaving.
80	Ginning Mill belonging to the same Company as No. 79.	Do. ...	Ginning.
81	The West Patent Press	20th February 1907.	Cotton press.
82	The Jumna General Pressing Company ...	Do. ...	Pressing.
83	The Oil Soap and General Milling Company ...	Do. ...	Oil soap and general milling.
84	Lala Narain Das and Nursing Das Mill ...	Do. ...	Ginning mill.
	Agra.		
85	John's Coronation Spinning Mill... ...	22nd February 1907.	Preparation of cotton and mule spinning.
86	The Agra Spinning and Weaving Mill ...	Do. ...	Spinning and weaving.

1	2	3	4
Serial No.	Name of Work.	Date of Inspection.	What Work is carried on.
	Agra—continued.		
87	The John Mill	22nd February 1907.	Spinning and weaving.
88	The Ginning Mill occupied by the same Company as No. 87.	Do. ...	Ginning.
89	Nay Smith's Ginning Mill	Do. ...	Ginning and pressing.
90	The Prince of Wales Spinning Mill ...	Do. ...	Spinning.
91	Messrs. Weyland and Company's Carpet Factory.	Do. ...	Carpet making.
92	The Jumna Ginning and Pressing Company ...	23rd February 1907.	Ginning and pressing.
93	The Agra Ginning Company, Limited ...	Do. ...	Ginning.
94	The Mufassal Company, Limited	Do. ...	Ginning Press and Oil Mill.
95	Works owned by Hiralal and Chunilal ...	Do. ...	Ginning.
96	The Broach City Press Company, Limited ...	Do. ...	Pressing.
	Cawnpur.		
97-99	Works of the Muir Mills Company (3 Mills) ...	25th February 1907.	Cotton spinning, weaving, dyeing and bleaching.
100	The Cawnpur Mills and the Army Clothing Manufacturing Company's Works.	Do. ...	Sorting, carding, spinning, weaving, finishing and dyeing of wool.
101	The Works of the Victoria Mills Company, Limited.	26th February 1907.	Ring spinning, mule spinning and weaving.
102-104	The Works of the Elgin Mills Company (3 mills).	Do. ...	Do.
105-107	The Works of the Cawnpore Cotton Mills Company (3 mills).	27th February 1907.	Do.
108	Ginning Factory owned by Badri Das ...	Do. ...	Ginning.
109	Sri Ram Mahadeo Pershad's Mill ...	28th February 1907.	Do.
110	Naya Chand Baldeshai's Ginning Mill ...	Do. ...	Do.
111	Nazaram Das and Luchman Das Ginning Mill.	Do. ..	Do.
	Nagpur.		
112-115	The Central India Spinning and Weaving Manufacturing Company's Works or Empress Mills (4 mills).	2nd March 1907...	Spinning and weaving, dyeing and bleaching.
116	The Central Provinces Spinning and Manufacturing Company's Works otherwise known as the Swadeshi Mill.	Do. ...	Ring spinning and weaving (cotton).
117	Volkarts Brothers' Agency	Do. ...	Cotton pressing and ginning.
118	Vinayak Ramchandra's Ginning Factory ...	3rd March 1907...	Ginning.
119	Thundiraj Atmaram Talute's Press and Ginning Factory.	Do. ...	Pressing and ginning.
120	Ramji Kanaa's Ginning Mill	Do. ...	Ginning.
121	Harvey and Sabapath Company, Limited ...	Do. ...	Ginning and pressing.

APPENDIX E.

List of persons examined—Millowners, millhands and others.

Bombay.

Mr. J. D. F. Engel	First Inspector of Factories for the Town and Island of Bombay.
* „ W. B. Chambers	Acting Special Inspector of Factories, Bombay.
* „ J. Monteath, I.C.S.	Assistant Collector and Chief Inspector of Factories, Bombay.
Capt. W. H. Houston, I.M.S.	Personal Assistant to the Surgeon-General and Joint Medical Inspector of Factories.
*Dr. Godinho	Deputy Health Officer.
Sir Sassoon David	David Mills.
Mr. Bomanji Dinshaw Petit	Maneckji Petit Manufacturing Company.
„ Dinshaw Pirozshaw Sethna	Do do.
„ Cowasjee Panday	Emperor Edward Spinning Mills.
„ H. Gawthorne	Kohinoor Mills.
„ S. Myers	David and Standard Mills.
„ Morarjee Narotum	Jivraj Baloo Spinning Manufacturing Company.
„ N. N. Wadia	Textile Manufacturing Company, Limited.
„ Fazulbhoy Currimbhai Ebrahim	Currimbhai Mills.
„ Mehralli M. Fakira	Do.
Jobber Dewjee Ganujee	Do.
Mr. N. B. Saklatwalla	Swadeshi Mills.
Hon'ble Mr. V. D. Thackersey	Hindustan Mills.
Mr. R. Wilson	Do.
Two jobbers	Do
Mr. Dwarkadas Dharamsey	Bombay Cotton Manufacturing Company.
„ J. F. Bradbury	Colaba Land and Mills Company.
„ S. A. Nathan	E. D. Sassoon Mills.
„ R. H. Crabtree	Do.
„ J. A. Wadia	Currimbhai Mills.
„ J. Wallace	Editor of the Indian Textile Journal.
*Rao Bahadur Vithalrao Krishnaji Vandekar.	......
*Mr. J. B. Leslie Rogers	Secretary, Millowners' Association.
* „ N. G. Powar	Assessment Department, Municipality.

*13 workers and several other men of the Maneckji Petit Mills

*6 young persons of the New Great Eastern Spinning and Weaving Company's Mill.

*1 male weaver, 2 framemen, 2 girls and 2 boys of the Bombay United Spinning and Weaving Company's Mill, Girgaum.

*Several hands of the Kaisar-i-Hind Spinning and Weaving Company's works.

*6 workers of the Mahadeo Dharmsey Manufacturing Company, Limited.

*12 young persons of the Currimbhai Mill, Parel.

*16 children of the Framji Petit Spinning and Weaving Company.

*A number of millhands were examined at their homes in the Govind Thak's Chawl and other adjoining chawls (about 200 hands). (*a*)

*A few young persons of the David Mills Company.

*Members of the Bombay Millowners' Association.

*23 children and young persons of the Sorab Hormasji Cotton Manufacturing Company's Mill.

*3 boys of the Jacob Sassoon Mill.

*2 workers of the Bombay United Spinning and Weaving Company's Mill, Girgaum.

Gunpat Balloo Shaik Ahmed Rama Dharma (female) Bhau Harribhai Maroti Manaji Shivo Saccaram (female)	*Workers, Colaba Land and Mill Company's Mill.
Mahomed Yakub Laxhman Ganoo Abdul Rahman Narayan Ganoo	*Workers of the Indian Mill.
A naikeen Govind Ladoo Laxman Balkrishna	*Workers of the Jam Manufacturing Company.
Capt. J. H. McDonald, I.M.S.	First Presidency Surgeon, Bombay.
*Major A. Street, I.M.S.	Second do.
Col. J. P. Barry	Third do.

*Managers of Mills.

(*a*) A written statement was also submitted by Capt. McDonald and Col. Barry.

Mr. G. W. Hatch, I.C.S., Collector of Bombay, submitted a note on certificates of children.

A written statement was submitted by Mr. Morarji Narotum representing the Jivraj Balloo Spinning and Weaving Company.

Groups of mill workers resident in the neighbourhood of Alibág and Pen. (This evidence was taken by the Mámlatdárs.)

Ahmedabad.

Mr. W. R. Diveeka ...	... Jehangir Vakil Mill.
„ R. M. Patel ...	... Guzrat Cotton Spinning and Manufacturing.
„ C. Shorrock ...	... Shark's Spinning and Manufacturing Company.
„ G. Robinson ...	... Hittechu Spinning and Manufacturing Company.
Hari Bhai ...	... Workers, Ahmedabad Spinning and Weaving Company.
Vir Aju Gandalji ...	...
Sukdeo Badal ...	...
Goman Moolji ...	...

*Groups of spinners and weavers belonging to the same mill.

Mr. Dadabhai Nasservanjee Nanawatty ...	City Magistrate, Ahmedabad.
„ Sorabji Dinshaw ...	... Karakur Mill Owner.

A written statement was submitted by Major W. E. Jennings, M.D., D.P.H., I.M.S., Joint Inspector of Factories, Ahmedabad.

Mr. Mansoobhai Buggoobhai ...	... Ahmedabad Manufacturing and Calico Printing Company's Mill.
„ Chinubhai Madhaval ...	... A Millowner.
„ Chimanlal Nagindass ...	... Guzrat Spinning and Manufacturing Company, Limited, &c.
„ F. McCormack ...	... Second Inspector of Factories, Ahmedabad.
„ Lalbhai Dalpatbhai ...	... A Millowner.

*Managers of Mills.

*20 representative Millhands.

*6 half-time boys of the Ahmedabad Ginning, Spinning and Weaving Company.

*A large number of half-timers of the Ahmedabad-Sarangpur Spinning Mill.

Bengal.

Mr. A Birkmyre ...	... Chairman, Indian Jute Mills Association.
„ J. B. Strain ...	... Member do.
Rai Bahadur Sita Nath Rai ...	... Bengal National Chamber of Commerce.
Babu Janaki Nath Rai ...	...
Lieut.-Col. W. G. Crawford, I.M.S.	... Medical Inspector and Civil Surgeon, Hooghly.
Lieut.-Col. F. J. Drury ...	... Civil Sugeon, Howrah.

A written statement submitted by Messrs. Birkmyre and Strain.

*Several children of the Hooghly Mills Company.

*Groups of Mechanics and Weavers of the Geo. Henderson's Jute Manufacturing at Baranagore.

*12 weavers of the Birkmyre Brothers' Hastings Jute Mill.

*Managers of Mills.

*The Committee interviewed Mr. Lamb about the Gourepore Mill, Mr. Hutchinson about the Hastings Jute Mill, Mr. Yule about the Ghoosery Cotton Mill.

Madras.

Capt. W. G. Richards, I.M.S.	... Medical Inspector of Factories for the Town of Madras.
Mr. H. T. Walters ...	... Special Inspector of Factories for the Town of Madras.

*Managers of all the Mills.

*40 half-timers of the works of the Madras United Spinning and Weaving Company, Limited.

Delhi.

Major D. M. Davidson, I.M.S.	... Civil Surgeon and Joint Inspector of Factories, Delhi.

*Managers of all the Mills.

Cawnpore.

Mr. S. H. Fremantle, I.C.S. ...	... Deputy Commissioner, Kherri, U.P.
„ S. M. Johnson ...	... The Muir Mills Company.
„ W. G. Bevis ...	... The Elgin Mills Company.
„ B. Briscoe ...	...
The Hon'ble Mr. McRobert ...	... Managing Director of the Cawnpur Mills, and the Army Clothing Manufacturing Works.

*Mill Managers.

Nagpur.

A written statement was submitted by the Manager of the Empress Mills, Nagpur.

*Mill Managers.

Note.—The evidence of persons marked with (*) has not been recorded in extenso, but in some cases it can be gathered from the Minute-Book of the Committee made over to the Government of India. The evidence or opinion of those not so marked has been forwarded to the Government of India.

APPENDIX F.

No. $\frac{10}{F.T}$ of 1906.

Factory Excise Office,
Custom House.

From

The PRESIDENCY INSPECTOR of FACTORIES,
Bombay;

To

The CHIEF INSPECTOR of FACTORIES,
Bombay.

Bhusáwal, 11th September 1906.

Sir,

I have the honour to forward herewith my Diary for the month ending 31st August last.

During the course of enquiries made at the factories owned by Messrs. * * * * I learnt that a small fire had occurred in their Press Factory on the 3rd April. Cotton belonging to one of their constituents was being pressed and at about 6-30 p.m. loose cotton passing through the Opener machine caught fire (a very frequent occurrence). Out of 16 women employed immediately in front of the Opener, 9 were burnt, four men were also burnt · six women and one man died from the injuries received. The outlets from the Press house were ample; had there been no enclosing walls the result would have [illegible] of the outlets, but must have at once attracted the fire up to their eyes.

The Press owners contributed Rs. 169 towards the assistance of the sufferers, but the actual employers and owners of the cotton upon which the people were working at the time refused to contribute a single rupee. The cotton burnt was insured and Rs. 1,500 was paid over by the companies concerned.

There is at present no clause under the Act, by which the dangers attending the employ*ment* of women in Press houses can be regulated: the presence of women in front of Opener machines [illegible] at work. [illegible] tion and [illegible] up into one even grade the several quantities of cotton [illegible] up into one lot. At this press the practice of placing women in front of the machine had only been started the day *before the fire occurred.*

Women should not be permitted to work in positions where at any moment they may be *burnt to death or struck dead by a stone hurled from the beaters.*

It is only in a small proportion of Press factories in the Presidency that women are allowed near or in front of the Openers. It is quite possible for as many as 50 women to be injured or lose their lives in a single fire on any one working day in several of the factories in the Presidency.

Plans of the building showing the position of the machine and the workers at the time of the fire will be submitted later.

I have the honour to be,
Sir,
Your most obedient servant,
(Signed) L. W. HARTLEY,
Presidency Inspector of Factories.

APPENDIX G.

Statement showing the total Mortality and the Mortality from Phthisis and other Respiratory Diseases amongst the General and Factory Labourers in Bombay.

General Labourers.

Year.	Deaths from Phthisis.	Rate per 1,000 of Population without dependents. 171,852	Rate per 1,000 of Population with dependents. 265,568	Deaths from other Respiratory Diseases.	Rate per 1,000 of Population without dependents. 171,852	Rate per 1,000 of Population with dependents. 265,568	Deaths from all causes.	Rate per 1,000 of Population without dependents. 171,852	Rate per 1,000 of Population with dependents. 265,568
1900 ...	1,001	5·82	3·76	1,587	9·23	5·97	12,094	70·37	45·54
1901 ...	1,124	6·54	4·23	845	4·91	3·17	10,645	61·94	40·08
1902 ...	607	3·53	2·28	670	3·89	2·52	7,249	42·18	27·29
1903 ...	343	1·99	1·29	521	3·03	1·96	6,797	39·55	29·35
1904 ...	310	1·80	1·16	858	4·99	3·23	6,078	35·36	22·88
1905 ...	432	2·51	1·25	841	4·89	3·16	7,269	42·29	27·37

Factory Labourers.

Year.	Deaths from Phthisis.	Rate per 1,000 of Population without dependents. 122,524	Rate per 1,000 of Population with dependents. 190,417	Deaths from other Respiratory Diseases.	Rate per 1,000 of Population without dependents. 122,524	Rate per 1,000 of Population with dependents. 190,417	Deaths from all causes.	Rate per 1,000 of Population without dependents. 122,524	Rate per 1,000 of Population with dependents. 190,417
1900 ...	641	5·22	3·66	643	5·23	3·37	5,199	42·44	27·33
1901 ...	613	5·00	3·21	364	2·97	1·91	4,427	36·13	23·24
1902 ...	308	2·51	1·61	207	1·68	1·08	2,686	21·91	14·15
1903 ...	270	2·23	1·41	180	1·46	·94	3,057	24·95	16 05
1904 ...	358	2·92	1·88	329	2·68	1·72	2,347	19·16	12·22
1905 ...	401	3·27	2·10	201	1·62	1·05	3,172	25·88	16·65

APPENDIX H.

FORM A2.

_______________ Factory.

Daily Muster Roll of Children under section 9.

Hours of work and intervals of rest allowed to the children :—

A (or first) Set work from _______________ until _______________. A Set rest from _______________ until _______________.
B (or second) set work from _______________ until _______________. B Set rest from _______________ until _______________.

Occupier's signature _______________

Note—The particulars relating to Set A should be written up not later than 8 a.m. and the particulars relating to Set B should be written up not later than 3 p.m. each day.

Factory number.	Certificate number as shown in Form A1	Name.	Set in which the child works.					Year, month and date.																															Number of days employed.	Rate of wages	Wages due	Deductions (fines for failure).	Net amount to be paid.
1	2	3	4	5	6	7	8																																10	11	12	13	14
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			Rs. a. p	Rs a. p	Rs. a. p.

[NOTE.—Columns 4 to 8 are provided to allow for the child being changed from one set to another.]

BOMBAY: PRINTED AT THE GOVERNMENT CENTRAL PRESS.

Administration Report of the Banswara State

for the year beginning the 1st October, 1943

and ending the 30th Sept 1944

INTRODUCTORY:—The shadow of the long and serious illness of His late Highness Rayan—Rai Maharajadhiraj Maharawalji Sahib Shri Sir Pirthi Singhji Bahadur, K. C. I. E. hung heavy over the State throughout the year, darkening the current of life of His Highness' subjects and depriving the administration to some extent of the benefit of His Highness' personal guidance and direction. His Highness passed away on the 27th July, 1944, mourned by all his subjects and lamented by every one who had the good fortune to come in contact with him. He was a remarkably able ruler, and sagacious administrator. Banswara State sustained a great loss in the demise of His late Highness.

During the illness of His late Highness, the administration of the state was conducted mainly by the Dewan of the state, Maharaj Lal Singh.

THE WAR:—His Highness' Government, pledged to wholehearted co-operation with the British Government in the efficient prosecution of the war, noticed with pleasure and satisfaction the tide of war turning in favour of the Allied nations and bringing the end more definitely in view. Enactments corresponding to Ordinances and other emergency legislation passed in British India were generally adopted in the State. The National War Front movement gathered much force and momentum. The Banswara State War Committee continued to function enthusiastically during the year for the successful termination of the War. The Red Cross Week was duly celebrated. Two units of Red Cross were prepared and despatched from here on 14th July 1944 to the Deputy Red Cross Commissioner, War Supply Depot, Bombay. Recruits for technical training were also sent over to the Recruiting Offices, Panch Kua Ahmedabad. A statement of the financial war effort is given in Appendix 'A'.

LEGISLATIVE ASSEMBLY:—The Rajya Parishad or Legislative Assembly was in session on the 25th and 26th June under the presidentship of the Dewan who is its ex-officio President. The House passed the Cattle Pound Act introduced by the Government. The Rajya Parishad is a nominated body with a non-official majority and is entitled to make laws, pass resolutions and put questions on subjects of general interest and welfare of the people.

ADMINISTRATION OF JUSTICE:—Justice is administered in the State by competent Law Graduates appointed under the Judicial Courts Constitution of 1942, which practically incorporates the provisions of the previous constitution of 1940 with minor modification:

The following courts were functioning in the State during the year under report:—

1. Ijlas Alia.
2. High Court
3. District & Sessions Court.
4. Civil Court.
5. First Class Magistrate, Northern Division.
6. First Class Magistrate, Southern Division.
7. Munsif and Second Class Magistrate's Court, Khandu

Magisterial powers have also been conferred on the following officers:—

Second Class Magistrate:—

(i) Conservator of Forests for offences under the Forest Rules.

Third Class Magistrate:—

(i) Tehsildars, Northern & Southern and Sadar Divisions, who can record confessions under Sec. 164 C. P. C. only.

(ii) Private Secretary to His Highness
Jurisdiction extends only to the members of the Private Staff.

Important British Indian enactments such as the Indian Penal Code, Criminal Procedure Code, Evidence Act, Transfer of Property Act, Limitation Act etc. are adopted in the State.

IJLAS ALIA:—Orders issued by His Highness the Maharawal Sahib Bahadur in judicial matters are issued in the name of Ijlas Alia.

JURISDICTION:—Besides exercising prerogative as the Sovereign Ruler of the State, and entertaining the petitions for mercy, Ijlas Alia also entertains appeals from the decisions of the High Court in the following matters:—

(1) *Criminal.*

Where sentences of death or life imprisonment are awarded.

(2) *Civil.*

(i) From any decree passed in appeal by the High Court in suits in which there has been no second appeal, if the decision is contrary to law, or to some usage having the force of law.

(ii) From any decree or final order passed by the High Court when the amount or value of the subject matter in dispute in the appeal exceeds Rupees Twentyfive thousand, and

(iii) The decree or final order appealed from sets aside or modifies the decision of the court immediately below.

All sentences of death and life imprisoment by the High Court require previous confirmation by Ijlas Alia.

The following is the statement of cases disposed of by the Ijlas Alia during the year under report, as compared with the previous year:—

Nature of Cases.	Year	Pending from last year.	Submitted during the year.	Total	Disposed of					Total	Pending at the close of the year	Remarks.
					Confirmed	Reversed	Amended	Remanded for retrial	Compromised or otherwise disposed of			
1	2	3	4	5	6	7	8	9	10	11	12	13
Appeals Civil ...	1942-43	...	1	1	1	...	...	...	...	1	...	
" " ...	1943-44	...	...	...	...	...	...	...	...	...	...	
Appeals Criminal	1942-43	...	...	...	...	...	...	...	...	...	...	
" "	1943-44	...	.	...	...	...	...	...	...	...	...	
Petitions for mercy.	1942-43	...	...	...	...	...	...	...	...	...	...	
	1943-44	...	...	...	...	...	...	...	...	...	...	
Review Civil ...	1942-43	2	...	2	...	...	...	...	...	...	2	
" " ..	1943-44	2	...	2	...	...	...	...	...	...	2	
" Criminal...	1942-43	...	...	...	...	...	...	...	...	...	...	
"	1943-44	...	...	...	...	...	...	...	...	...	...	

HIGH COURT

PERSONNEL—Mr. G. V Chitale, B A., LL. B., continued to work as High Court Judge throughout the year.

The Judge is engaged on part time service and visits Banswara thrice a year to dispose of appeallate, revisional and other High Court work.

JURISDICTION—All the powers of the High Court under the Codes of Civil and Criminal Procedures and under any other law or order for the time being in force in the State, are exercised by him The only limitation to the powers of the High Court is that any *sentence of death or imprisonment for life*, passed by him shall be subject to confirmation by Ijlas Alia

The High Court also exercises disciplinary jurisdiction over pleaders and mukhtars, and deals with their enrolment, removal etc.

The High Court has also the inherent power to make such orders as may be necessary in any case to prevent abuse of the process of any court subordinate to it or otherwise to secure the ends of justice

The High Court Judge is also empowered to inspect and supervise the working of any court in the State, and to issue such directions and introduce such reforms as he may deem necessary for the better working of the Court either generally or in regard to particular matters.

CASE WORK—Appendix 'B' contains the details of the cases disposed of by the High Court during the year under report as compared with the previous year.

DISTRICT & SESSIONS COURT.

PERSONNEL—Mr. O. S Trivedi, B. A ,LL B, continued to work as District and Sessions Judge throughout the year.

JURISDICTION:—(1) The District Judge hears all appeals under the Civil Procedure Code against the decrees and orders passed by the subordinate Judge. He has jurisdiction to try civil suits above Rs. 2,500/- *in value All appeals from the* the decrees and orders passed by the Civil Court, Khandu are heard by the District Judge *The District Judge has also jurisdiction in all matters relating to* Guardianship

(2) The Sessions Judge exercises all appeallate and revisional powers under the Criminal Procedure Code. The Sessions Judge may pass any sentence authorised by law except a sentence of death or of imprisonment for a term exceeding seven years, but where in his opinion a sentence of death or life imprisonment or imprisonment for a term exceeding seven years, is considered necessary, he has to report such cases to the High Court for necessary orders He is also empowered to inspect and supervise the working of the subordinate courts. The Sessions Judge is also invested with the powers of *Additional District* Magistrate.

CASE WORK—For the cases disposed of by the District and Sessions Court during the year under report as compared with the previous year see Appendix 'C'.

CIVIL COURT.

During the year under report Babu Rajendra Prasad, B. A , LL. B, continued to work as Civil Judge and Boundary Officer.

REGULAR SUITS—The number of suits pending at the beginning of this year was 37 as contrasted with 44 in the previous year. 91 suits were instituted this year as against 78 in the previous year. Total number of cases that came up for decision this year was 128, out of which 79 were decided, leaving the balance of 49

cases at the close of this year, as against 37 of previous year. The balance of 49 cases includes 12 cases instituted during the months of August and September.

Of all the regular suits disposed of this year 12 were decided ex-parte 29 were admitted or compromised, 20 were struck off the file for default of appearance of parties or for want of proof or by withdrawal by the plaintiffs, 18 were otherwise disposed of.

SMALL CAUSE SUITS:—The number of suits pending at the beginning of this year was 265 as contrasted with 152 in the previous year and 1666 suits were instituted this year as against 1329 in the previous year. Total number of cases that came up for decision this year was 1931, out of which 1468 were decided leaving the balance of 463 cases at the close of this year as against 265 of previous year. The balance of 463 includes 342 cases instituted during the months of August and September.

Off all the suits disposed of this year 597 were decided ex-parte, 295 admitted or compromised, 406 were struck off the file for default of appearance of parties or for want of proof or by withdrawal by the plaintiffs and 70 cases were otherwise disposed of.

Classification of suits of both regular and small cause nature instituted in this year according to the value of the subject matter was as under:—

1523 suits upto the value of Rs. 100/-
211 „ „ „ „ „ and below Rs. 500/-
14 suits above Rs. 500/- and below Rs. 1,000/-
9 suits above Rs. 1,000/- and below Rs. 2,500/-

The aggregate value of the suits instituted in this year was Rs 1,09, 166/4/6 as against Rs. 68, 778/7/- of the previous year.

EXECUTION OF DECREES:—The number of petitions for execution of decrees pending at the beginning of this year was 319 as against 515 in the previous year. The number of petitions for execution of decrees filed this year was 959 of the value of Rs. 89, 204/1/6 as against 1046 of the previous year. Of these 900 petitions of the value of Rs. 79, 183/7/6 were disposed of this year as against 1242 of the previous year. In all 378 petitions were pending disposal at the close of this year, out of which 229 are below 6 months, 108 below 12 months and 41 above 12 months.

9 objections, against proceedings in execution cases were pending at the beginning of the year as against 28 in the last year and 22 objections were filed during this year as against 42 in the last year. Out of the total of 31 awaiting disposal 18 were decided as against 58 in the last year, 13 objections are pending at the close of this year.

CIVIIL APPEALS:—2 appeals were pending at the beginning of this year as against 4 in the last year and 17 appeals were filed during this year against the decision of this court. Of these 19 appeals 16 were decided leaving a balance of 3 at the close of this year.

CIVIL REVISIONS.–8 revisions were pending at the beginning of this year as against 11 in the last year and 14 were filed this year as against 29 in the last year. Of these 22 Revisions 19 were disposed of as against 32 in the last year leaving a balance of 3 at the close of the year.

BOUNDARY CASES:—15 cases were pending at the beginning of this year as against 21 in the last year. No cases were instituted during this year.

FIRST CLASS MAGISTRATE. NORTHERN DIVISION.

The criminal cases brought to trial during the year under report numbered 564 involving 778 persons. This number includes 114 pending from the past year involving 218 persons awaiting trial. 467 cases involving 601 persons were disposed of during the year under report as against 286 cases involving 525 persons in the past year. Cases pending at the close of the year under report number 97 involving 177 persons as constrasted with the pending 114 cases of the past year involving 218 persons. This number 97 includes 7 pending cases of the Khandu court involving 9 persons and 7 cases instituted in this court in which enquiry under Sec. 202 I. P. C. was ordered.

No appeal was filed against the judgment of the 2nd Class Magistrate, Khandu, during the the year under report.

FIRST CLASS MAGISTRATE. SOUTHERN DIVISION.

The total number of criminal cases brought to trial during the year under report was 157 involving 280 persons. This number includes 38 pending of the past year involving 108 persons, awaiting trial.

134 cases involving 204 persons were disposed of during the year under report as against 131 cases involving 237 persons in the past year cases pending at the close of the year under report number 23 involving 76 persons as contrasted with the pending 38 cases of the past year involving 108 persons.

EXTRADITION.—The charge of Extradition remained with the First Class Magistrate, Southern Division, during the year under report

There exists an Extradition Treaty on reciprocal basis between the Banswara State and British India.

... with Alwar, Balasinor, Jaora, Jhabua, Jhalawar, Ratlam, Sailana and Tonk States.

The period of temporary arrangement with Tonk State was completed on the 29 th February, 1944, and now correspondence is going on for making it permanent.

Details of Extradition cases with various States are given in the following table.—

Name of States	BANSWARA Vs OTHERS						OTHERS Vs BANSWARA					
	Case of past year	Cases of present year	Total	Disposal present year	Balance of cases	Accused surrendered	Cases of past year	Cases of present year	Total	Disposal present year	Balance of cases	Accused surrendered
Partabgarh	2	—	2	2	—	2	2	2	4	—	4	6
Dungarpur	2	5	7	3	4	4	2	5	7	1	3	6
Mewar	2	3	5	—	5	—	—	1	1	—	1	—
Patta Kushalgarh	—	2	2	2	—	2	3	1	4	2	2	—
Ratlam	—	3	3	—	3	—	—	—	—	—	—	—
Panchmahals	—	1	1	1	—	1	1	—	1	1	—	—
Gwalior	—	1	1	1	—	1	2	—	2	2	—	—
Total...	6	15	21	9	12	10	10	9	19	9	10	12

DEFENCE, POLICE & PRISONS.

ARMY.

PERSONNEL:—Maharaj Chhatra Singh continued to work as the Commanding Officer.

STRENGTH:—The strength of Prithvi Rifles is 105 including officers and men.

COMPOSITION & TRAINING;—The corps consists very largely of Rajputs. It is regularly drilled under the supervision of the Subedar and is equipped with 110 single loading rifles of .303 bore. It is housed in specially erected barracks and is provided with free rations. The corps is employed chiefly on mounting guards and providing escorts. A few of the men have received training in heliography as well.

STATE BAND:—The State Band which is attached to the military consists of 1 Band master and 25 Bandsmen.

ARTILLERY:-The artillery consists of two serviceable saluting guns.

EXPENDITURE.-The total expenditure of the Prithvi Rifles amounted to Rs. 21, 922/-as against Rs. 27,434/-in the previous year.

POLICE

CHARGE:—Mr. Raghubar Prashad Misra, S. P. retired on 12th October, 1943. Munshi Habibullah Khan officiated as the Superintendent of Police till the 31st January, 1944. Mr. OnkarPrashad Tewari took over charge from him.

STRENGTH:—The strength of the Police Force was 290 at the end of the year which was also the number in the Previous year.

POLICE STATIONS:—There are 11 Police Stations & 12 outposts in the State.

UNIFORMS & ARMS:—The Police is provided with uniform and the men are equipped with Henry Martin Sniders, and muzzle loading guns.

EDUCATION & TRAINING:—After enlistment, a recruit is trained in squad drill. From among the efficient constables and Head Constables promotions are made to the higher posts in the cadre.

PROMOTIONS & PUNISHMENTS:—During the year under report 29 persons received promotions, while 2 were dismissed and 50 departmentally punished and 1 punished judicially.

INVESTIGATION:—The following table gives the details of the investigation work done by the police during the year under report as compared with the previous year:—

Year	Number of crimes					Number of accused							Percentage of Persons Convicted to those Challaned.	Remarks.
	Pending from last year	Reported during the year	Total	Disposed of	Balance	Awaiting trial	Arrested during the year	Total	Sent up for trial	Convicted	Acquitted or Discharged	Balance		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
State Police														
1942-43	85	423	508	428	80	154	207	361	361	162	95	104	63	
1943-44	80	430	510	448	62	104	208	312	312	111	90	107	56.2	
Jagir Police														
1942-49	28	100	128	101	27	34	56	100	100	27	35	38	43.5	
1943-44	27	95	122	91	31	38	53	91	91	19	18	54	51.35	

SERIOUS OFFENCES:—These cases include murder and dacoity cases of both the State and the *Jagir territories.*

These offences reported during the year are compared with those of the *previous year in the following table:—*

	Crimes	1942-43	1943-44	Remarks.
1	Murder	3	9	
2	Attempt to Murder	3	3	
3	Culpable Homicide	–	4	
4	Dacoity	3	4	
5	Robbery	24	11	
		33	31	

PROPERTY STOLEN AND RECOVERED—The value of the property stolen and recovered during the year under report is compared with that in the previous year as below:—

Year	Stolen		Recovered	Percentage of the recovery
1942-43	Rs 18,049	STATE	Rs. 3,756	20.81
1943-44	„ 28,365		„ 6,590	25.2
1942-43	„ *2,411*	JAGIR	„ *807*	*33.41*
1943-44	„ 4,640		„ 1,712	36.81

JAGIR POLICE:—The Jagirdars of the State are also required to maintain a certain number of Police Force within their respective Jagirs. It is under the guidance and control of the State Superintendent of Police in matters concerning crime, its prevention and detection and the maintenance of Peace and Order.

During the year under report the Superintendent of Police inspected the Police of Jagir Khandu and issued necessary instructions for improving the efficiency of Jagir Police.

The total number of Jagir Police amounted to 95 persons as against 95 in the previous year.

WORKING OF JAGIR POLICE:...The details of the working of the Jagir Police during the year under report and the previous year have already been shown in the table given above

EXPENDITURE: ..The total Budget provision for the Police for the year amounted to Rs 38,693/- in the State. As against this the expenditure of the Police amounted to Rs 31,202/- in the State and Rs. 16,422/- in the Jagir, total Rs. 47,624/- as against Rs. 30,214/- and Rs. 15,101/-, total Rs 45,315/- respectively in the previous year.

FINGER PRINT BUREAU:—The Finger Impression work conducted during the year was as follows:—

		1942-43	1943-44
1.	Finger print slips sent for record to the Bureau at Ajmer	64	18
2.	Finger print slips sent for Record to Ajmer and other Bureau.	16	16
3.	Cases traced	2	2
4.	Cases untraced	14	14

VILLAGE & ROAD CHAWKIDARS:...40 Chawkidars are engaged by the State for night patrol of larger villages situated away from Police Stations. Similar arrangements exist in the Jagirs.

The State also maintains 33 road Chawkidars for the safety of the traffic on major routes.

JAIL.

There is only 1 Jail in the State. It is situated in Banswara proper.

Jail management is governed by Ajmer-Merwara Jail Manual, 1936.

During the year under report Hafiz Mohammad Shahbaz Khan worked as Jailor. Mr. Kantilal Ojha, B. A. LL. B., First Class Magistrate, was the Superintendent of Jail. and the powers of the Inspector General of Prison vested in Mr Ochhablal Trivedi, B. A , LL. B., the Sessions Judge, Banswara State.

There is a separate guard for the Jail. Its strength is of 24 Warders and 3 Havaldars. The Jail Guard is supplied with Police Pattern Uniform and also provided with necessary Arms and Ammunition, namely 23 Rifles Henry Martiny (duly fitted with Bayonets) and brass cartridges 293 (Bullets 147 and shots 146). There are also four Muzzle loading guns. The Jail Guard is under the control of the Jailor and the Arms and ammunition remain in his charge.

During the year under report the Jail was inspected by the Inspector General of Prison on 14-4-1944.

No deaths among the prisoners occurred during the year under report. General health of all the Jail inmates remained good. Sick prisoners were daily attended to by a medical officer. No epidemic broke out in the Jail during the year.

General management and discipline among the prisoners and sanitation of the Jail remained satisfactory. The convicts with hard labour worked in the garden, printing press and Jail factory.

The food, clothing, bedding, and covering provided for the convicts were clean and wholesome. The total expenditure on the Jail, including the maintenance of the Prisoners and the establishment amounted to Rs. 7,254/6/3 for the year under report against Rs. 7,945/9/6 of the last year.

In the Jail Factory there are produced cotton Durries, Carpets, Khadi cloth, Dusters, Niwar, Woollen Blankets, Asans, Hemp Durries, Curtains and Prisoners beds and also bamboo chicks.

Total sale of Jail Factory goods during the year under report amounted to Rs. 2,064/6/6 including profit of Rs. 1,111/4/6 against the sale of last year which was Rs. 1,692/14/- including profit of Rs. 822/12/10 only.

There were 45 convicts left over form the previous year in the Jail, and 107 were admitted during the year. 107 were released, and 1 escaped, leaving 44 in the Jail at the end of the year.

REVENUE & FINANCE.

PERSONNEL: ..Mr. Maganlal Nanavaty, B. Com., continued to be the State Accountant during the year under report.

BUDGET:—The annual Budget for the year 1943-44 received the final sanction of His late Highness the Maharawal Sahib Bahadur on the 27th June, 1944.

The Account Books of the State for the year 1943-44 were closed on the 30th September, 1944 for annual check and compilation.

GROSS INCOME AND EXPENDITURE:—*The gross income during the year* under report amounted to Rs 30,74,085/-. Added to the opening balance, it amounted to Rs. 38,80,154/- as against Rs. 20,13,450/- in the previous year. The gross expenditure amounted to Rs. 22,58,199/- as against Rs. 12,07,391/- in the previous year.

OPENING & CLOSING BALANCE:—The year opened with a cash balance of Rs.8, 06,059/7/11 and closed with that of Rs.16,21,955/5/10.

NET INCOME:—The following table compares and contrasts the net income of the year with that of the previous year, and the Budget estimates of the year:—

Year	Estimated	Actual	Remarks
1942–43	Rs. 8,01,792	Rs. 12,36,573	+ 4,34,781
1943–44	Rs. 10,24,251	Rs. 16,34,256	+ 6,10,005
	+ 2,22,459	+ 3,97,683	

The actual net income of the year (Rs 16,34,256) exceeded the Budget estimate (Rs 10,24,251) by Rs 6,10,005/-and the actual net income of the previous year by Rs 3,97,683/-. This year the largest amount of revenue and constitutes a record for the State. The principal increase was under the Head "Customs and Excise", which was due to abnormal war conditions.

NET EXPENDITURE:—The following tabular statement compares and contrasts the net expenditure of the year with that of the last year, and the Budget estimate for the year:—

Year	Estimated	Actual	Surplus
1942–43	Rs. 6,90,657	Rs. 6,80,813	Rs. 10,144
1943–44	*Rs. 9,88,271*	*Rs. 8,19,646*	*Rs 1,68,625*

Although the actual expenditure was higher than that of the last year by Rs. 1,38,833, it was less than what was estimated for the year by Rs 1,68,625 The principal Heads under which expenditure was higher were Excise, P W D. the newly established Electrical Department, Ceremonials, and expenses in connection with His late Highness' illness

SURPLUS.—The surplus of Net Income over expenditure during the year under report and the previous year can be judged from the following *figures:*—

	1942-43	1943-44
Income	Rs. 12,36,573	Rs. 16,34,256
Expenditure	Rs. 6,80,813	Rs. 8,19,646
Surplus	Rs. 5,55,760	Rs. 8,14,610

BANK LOANS AND OTHER INVESTMENTS:—The amount outstanding as Bank Loans and other investments was Rs. 2,23,598/9/9 at the beginning of the year. A sum of Rs. 16,933/6/4 accrued as interest bringing the total to Rs. 2,40,532/-/1. Of this amount Rs. 15,903/13/ 3 were refunded during the year, and Rs. 12,523/6/8 had to be written off, leaving a balance of Rs. 2,12,104/12/2 at the close of the year.

Nothing was advanced under this head during the year under report.

Takavi advances made during the year amounted to Rs.1,000/-.

A sum of Rs. 944/5/- accrued as dividend on the shares of the face value of Rs. 10,000/- held in the local Commercial and Industrial Bank Ltd.

There was a Cash balance of Rs. 22,218/4/- at the close of the year to the credit of the State in the current accounts with Banks as follows:

Imperial Bank of India	(Ajmer Branch)	Rs. 19,671/9/3
	(Dohad Branch)	Rs. 1,549/7/-
Bank of Baroda Ltd.		Rs 997/3/9
		Rs. 22,218/4/-

The advances against the different State Departments of the State in the Imprest and other Advance accounts amounted to Rs. 1,91,922/10/7 as against Rs. 1,23,852/10/4 in the previous year.

The Municipality paid off the total out standings due from it and amounting to Rs. 10,645/-/9 during the year.

No debt is owed by the State.

DEPOSITS AND REFUNDS:—A sum of Rs. 1,79,713 was held in deposit at the beginning of the year. Rs. 4,99,143/- were received during the year, and Rs.4,39, 167/ -were refunded leaving a balance of Rs. 2,39,689/- at the close of the year, due to the sundry departments of the State and the Thikanas under the management of the Court of Wards excluding Garhi Jagir. This balance lies in the State Treasury along with the general cash balance

STATEMENT OF INCOME & EXPENDITURE:—A statement showing the total Receipts and Disbursements of the State under the various heads for the year 1943-44 is shown under Appendix 'D'.

ASSETS AND LIABILITIES:—The following is a statement of Assets and Liabilities at the close of the financial year viz. the 30th September, 1944:—

ASSETS	Rs.
Cash in the Treasury	16,21,955
Cash with Banks	22,218
Investments—	
Bank Loans	2,130
Other Loans	14,122
Mortgage of Bhatpur and Amroli factories	1,95,843
Takavi Loans	3,579
Advances outstanding	
State Departments	1,91,923
Jagir Settlement	36,150
Arrears of Land Revenue	1,34,007
Arrears of Abkari Contract	1,10,703
Opium purchase account	73,223
Bhang purchase account	698
Total	24,06,551

LIABILITIES		Rs.
Deposits outstanding and due to departments ...	..	2,39,689
	Total	21,66,862
	Net Assets	24,06,551

The State has acquired rights of full ownership over the Ginning and Pressing Factories *situated at Bhatpur and Amroli in Baroda State which were formerly* mortgaged with the State by the ex-Abkari contractor by virtue of a sale deed

LAND REVENUE & SETTLEMENT

PERSONNEL:—Mr. Shyam Shanker Shivapuri, Chief Revenue Officer and Settlement Officer was in charge of the Department till 11th February 1944 when he was retransferred to the Forest Department Mr. Chandra Bhushan Shukul *was appointed to the post and he* continued *to hold the charge till the* close of the year under report.

The Chief Revenue Officer also works as Sub-Registrar, Banswara and *Boundary Officer in respect of disputes* between *Jagirs.*

ADMINISTRATIVE DIVISIONS:—For purposes of revenue administration, the State is divided into three Tehsils namely Sadar, Northern and Southern Tehsils. *Each Tehsil is under a Tehsildar who is assisted by an appropriate number of* Girdawar, Kanungos and Patwaries

VILLAGES.—The number of Khalsa, Jagir and Muafi villages of the State at the *close of the year was as follows:—*

Year	Khalsa	Jagir	Muafi	Total
1942-43	386	726	42	1154
1943-44	419	693	42	1154

During the year, 15 villages of Sarwan Jagir lapsed to the State due to the demise of Maharaj Madansingh. Eighteen villages of Mahudi Kheda Jagir (Gadabandhi) also lapsed to the State. Thus altogether 33 villages reverted to Khalsa. Sodalpur Jagir (Gadabadhi) remained under the management of the Revenue department. Jagir Vasi was similarly under the management till it was put under the Court of Wards Tamatia Ada was also put under the management of the department for similar reasons.

TRIBUTE FROM JAGIRS.—The total amount of tribute received from the Jagirs was Rs 15,817/13/6 as compared to Rs.16,368/13/6 in the last year.

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AREA UNDER CULTIVATION:—The total area under cultivation in Khalsa villages was 172 square miles. Out of the 419 Khalsa villages, the annual land record papers of 382 villages were compiled. The papers of 4 villages remained incomplete. The remaining 33 villages, which were resumed during this year, are awaiting Settlement.

The following statement shows the area under cultivation in respect of 382 villages the Settlement records of which had been completed:—

Year	No. of villages	Total area	Area Cultivated during the year	Area Surrendered during the year	Total of Columns 4+5	Uncultivated area		Remarks
						Culturable	Waste	
1	2	3	5	6	7	7	8	9
1942-43	381	10,38,036	2,67,471	52,056	3,19,527	1,82,047	5,36,462	Area is in Bighas
1943-44	382	10,41,382	2,74,576	57,008	3,31,584	1,73,670	5,36.128	2½ Bighas-1 Acre

The total cropped area during the year was 3,48,340 Bighas as against 3,42, 982 Bighas in the last year. The total two crop area was 73,764 Bighas and Nautor land brought under cultivation was 13,803 Bighas as against 75,511 Bighas and 15, 481 Bighas respectively in the previous year.

KHARIFF & RABI CROPS:—The following statement shows the area, in Bighas under Kharif and Rabi crops of the Khalsa villages:—

Khariff			Rabi		
Name of Crop	1942-43	1943-44	Name of Crop.	1942-43	1943-44
1 Maize	97782	100580	1 Wheat	29233	24749
2 Sal (Paddy)	42909	39514	2 Wheat mixed with other crops	18217	16160
3 Til	40322	46736	3 Barley	3741	2673
4 Urad, Moong	7111	8958	4 Barley mixed with other crops	4116	2482
5 Hemp (Jute)	5215	5841	5 Gram	43594	51869
6 Sugarcane	1561	2053	6 Methi	1739	2212
7 Gowar	2397	2820	7 Cumin (zira)	103	64
8 Kuri, Kodra (small grains)	37582	33004	8 Sarson & Linseed (Rye)	171	336
9 Cotton	3425	4261	9 Poppy	72	11
10 Groundnuts	1021	1220	10 Hemp. (Bhung)	7	4
11 Tobacco	218	140	11 Garden produce	292	244
12 Chillies	1059	1251	12 Others	266	181
13 Garden produce	94	123			
14 Others	733	854			

DEMAND & COLLECTION:—The demand and collection of land-revenue during the year as compared with the previous year was, as shown below;—

Year	Demand			Collections			Total arrears at the close of the year
	Ordinary Rs	Nautor Rs.	Total Rs.	Fixed Rs.	Nautor Rs.	Total Rs.	Rs.
1942-43	2,12,417	24,831	2,37,248	2,07.473	18,363	2,25,836	11,412
1943-44	2,19,752	29,994	2,49,746	2,18,358	23,681	2,42,039	7,707

TOTAL RECEIPTS:—The total receipts from all the sources of the revenue of the department amounted to Rs 4,19,676/-as compared to Rs.3,78,723/-in the previous year, as shown below.—

Head of Revenue	1942-43 Rs.	1943-44 Rs.	Remarks
1 Land Revenue	2,27,300	2,42,727	
2 Arrears of Land Revenue	45,756	53,464	
3 Cesses	22,490	23,931	
4 Tanka	16,369	15,818	
5 Nazarana	164	9,858	
6 Mahua trees	7,794	8,242	Realised by the Customs Department
7 Jhumpi .. .	25,413	33,737	
8 Lekh (adoption fees) ...	86,88	2,465	
9 Contracts	1109	1,239	
10 Interest on Takavi etc. ...	519	445	
11 Boundary disputes. ...	60	65	
12 Marriage Cess ...	11,139	19,281	
13 Miscellaneous ..	11,922	7,314	
14 Thikana Sarwan ...		1,090	Realisation of loan of the Thikana
	3,78,723	4,19,676	

POPPY & HEMP CULTIVATION —Poppy and Hemp (Bhang) are grown in the State only by those persons who are granted licenses by His Highness'Government A proper control is kept over this cultivation. Besides the local produce of poppy, 65 mds of opium was purchased from the Government Central Warehouse, Indore. Bhang was grown this year again in the Kushalbagh, Banswara and therefore no licenses for its cultivation were issued There was a little shortage of Bhang in the stock and 3 maunds of Bhang was therefore purchased from Partabgarh State.

The following statement shows the quantity of produce and the area cultivated during the last two years: ..

Crop	Year	No. of licenses issued	No of lihenses by Which cultivated	Area under cultivation			Produce			
				Acre	Bighas	Bis	Mds.	Srs	Chh.	Tolas
Opium	1942-43	464	413	214	...	...	47	23	13	2½
	1943-44	195	185	131	...	...	15	18	10	2¼
Hemp (Bhang)	1942-43	In Kushalbagh Garden		3	...	...	28	29	8	.
	1943-44	"		2	...	...	11	3	6	...

GANJA·—Ganja was not cultivated in the State during the year of report Five maunds of ganja were purchased during the year from Holkar State's Warehouse at Sanawad.

COMMERCIAL CROPS:—The commercial crops grown in the State and their area under cultivation has been shown under the statement of Kharif and Rabi crops given above.

IRRIGATION:—The area irrigated during the year was 5439 Bighas as against 5735 Bighas in the previous year.

The number of wells sunk during the year was 22 as against 21 in the previous year.

Use of the water finding machine was made for locating the site of wells.

A sum of Rs.2,000/-was set apart in the Budget for irrigation and forx repair of tanks.

TACAVI:—Tacavi loans are given to the agriculturists for the improvement of land, purchase of seeds and cattle, and to sink wells for irrigation. The rate of interest on these loans is 6¼% per annum and it is re-payable in 5 years' time. The details of the loan advanced and the amount recovered during the year is given below, the figures are for the last two years:-

Year	For bullocks and seeds	For repairs to wells and tanks	Total	Advanced during previous years	Total of columns 5 & 6	Recorvered during the year	Balance
1942-43	345	105	450	5969	6419	2488	3931
1943-44	220	560	780	3931	4711	1132	3579

RAINFALL & CRCPS:—The 12 Rainguage stations in the State were as usual maintained during the year. The details of the rainfall recorded are in Appendix 'E'.

About 34" of rainfall is considered sufficient in a year. During the year under report the average rainfall in the State was 59.46 inches as against 31.52 inches in the previous year. The highest rainfall recorded was 69.8 inches at Danpur and the lowest was 47.87 inches at Shergarh.

The monsoons broke out in the first week of June and sowing commenced all over the State. However due to incessant and heavy rains in July and August 1944 the maize crop was considerably damaged. Cultivators at many places replaced it immediately by paddy but, it being rather late in the season, they could not get full returns. Til war too damaged. The heavy rainfall, was responsible for the loss ⅜ of the total maize crop, ⅝ of the Til produce and ¼ of the crops.

The Rabi crop of the year was, on the whole satisfactory except that the wheat was partially damaged due to a disease locally called 'Gerua'.

FODDER & WATER:--Fodder and water were sufficiently available for the cattle throughout the year.

CONDITION OF CATTLE:—The cattle of a few villages in the Thikana of Kalinjra and in Kunda (Khalsa) suffered from Small-pox resulting in the loss of 126 cattle. At other places their condition remained satisfactory. The prices of cattle, particularly of bullocks, went high and some difficulty was experienced in purchasing them.

AGRICULTURAL STOCK:—The following table gives the details of agricultural stock of the State in the last two years:-

Kind	1942 43	1943-44	Increase	Decrease	Remarks
1 Ploughs	42,351	48,033	5,682		
2 Carts	4,815	5,230	415		
3 Bullocks	1,03,432	1,06,487	3055		
4 Cows	1,00,465	1,10,140	9675		
5 Buffaloes male	8,840	8,221		619	
6 „ Female	59,940	63 699	3,759		
7 Horses & mares	2,832	3,021	189		
8 Donkeys	6,214	6,120		94	
9 Sheep & Goats	1,04,659	1,10,485	5826		
10 Camels	1,525	1,979	454		
11 Cane Crushers	436	463	27		

LOCUSTS.—No locusts were seen in the State during the year.

PRICES OF FOODGRAINS:—The following table gives the price levels of *the different foodgrains during the year under report, as compared to the previous* year. The prices record a rise and this is attributed to the abnormal times –

Name of the commodity	January				July			
	1943		1944		1943		1944	
	Srs	Chh	Srs	Chh	Srs.	Chh	Srs.	Chh.
1 Maize	10	.	10	.	8	0	10	...
2 Wheat	10	.	9	...	9	.	8	...
3 Gram	13	12	9	.	9	...	9	..
4 Barley	11	2	8	.	9	..	8	8
5 Rice Kamod	6	6	4	4	5	4	4	4
6 „ Ordinary	7	12	5	4	6		5	4
7 Pulses urad	9	..	5	9	7		5	9
8 „ Mung	9	...	4	14	6	6	4	13
9 Ghee	..	13	..	8½	..	11	...	10
10 Gur	4	9	2	12	4	...	3	11
11 Sweet Oil	2	.	1	9	1	10	2	
12 Chillies	2	1	2	3	2	2	2	8
13 Salt	8	..	8	3	8	4	8	..
14 Sugar	2	4	1	14	2	..	1	14
15 Tobacco	1	8	...	12	...	14	.	7

GENERAL:—During the year, a training class for the preliminary training of candidates for Patwariship was held in the months of July and August, 1944.

Agricultural Associations were started at suitable centres in each Tehsil, in the State in connection with the "Grow More Food" campaign.

The general economic condition of the people remained satisfactory.

SETTLEMENT DEPARTMENT.

During the year under report the charge of the department remained with the Chief Revenue Officer who worked also as the Settlement Officer.

The work of Settlement also went on in the Jagir areas of the State.

CUSTOMS & EXCISE.

PERSONNEL:—The administrative charge of the Customs and Excise departments in the year under report lay with Mr. T. K. Joshi B. A., Superintendent, Customs and Excise.

The Superintendent remained on tour for 32 days. In addition to the work of supervision, inspection, and enquiry, the chief item of his tour programme was the study of the border situation.

EXECUTIVE & PREVENTIVE STAFF:—For the purposes of Customs and Excise, the State is divided into four circles each under the charge of an Inspector. In the year under report one post of the Inspector was converted into that of a Sub Inspector. One post of a Supervising Inspector, four posts of Girdawars, five of Hawaldars each assisted by three to four constables were newly created. The post of the Superivising Inspector could not be filled, a suitable man not being available.

DISTILLERY:—The Distillery Inspector and the Distillery Engineer look after the work of distribution and manufacture of liquor respectively. The Distillery Inspector is directly responsible for the efficient working of the Distillery.

CUSTOMS NAKAS & OUTPOSTS:...In the year preceding the one under report there were 21 Nakas and 1 Chowki. In the year under report in addition to 21 Nakas and 1 Chowki, 11 new border-chowkis have been established, bringing the total number of Nakas and Chowkis to 21 and 12 respectively. The padla Chowki was shifted to Vichhawada.

LOCAL TRADE:—The local trade of the State consists chiefly of agricultural produce, small indigeneous urban industries like cutlery, wood work, etc. small rural indigeneous industries like spinning and weaving. The import trade consists chiefly of cloth, condiments, salt, sugar, kerosine and other necessities of life.

TARIFF:—(a) Import Tariff:-The Import-tariff of the State has always remained more or less unchanged. The only important change during the year under report is that on most of the items of import, the principle of assessing duty on value instead of weight has been adopted.

(b) Export Tariff.-Banswara State is more or less a surplus State in nearly all agricultural products including essential foodgrains. However, in view of the abnormal situation created by the war, the export of some of the important essential foodgrains, for example, wheat and maize is completely banned, while the export of other food stuffs namely paddy, gram etc. is allowed on the condition of reserving a part of the total stock selling it at a rate fixed so as to be easily purchaseable by the public. The practice of reservation has also been extended to the agricultural products of less essential nature namely til, gur, dals, etc. and ghee.

This system made the reserved quantities available to the public at Banswara city, as detailed below:—

Commodities	Quantity in Bengal Mds.
1. Oil	3,549
2 Ghee	1,628
3. Gur	3,503
4. Tuwar	1,257
5. Chillies (Mirch)	182
6. Paddy	1,365

The above mentioned commodities were distributed to the public through the Supply & the Price Control Committee.

The guiding principle of regulating the export tariff has been to secure the best adjustment of the interests of the agriculturists, the traders and the consuming public.–

EXPORTS & IMPORTS· ..A comparative statement of the total exports and imports of the year under report and the year preceding it, is given below –

IMPORTS			EXPORTS.		
Commodities	1942–43. In Bengal Mds.	1943-44	Commodities	1942-43. In Bengal Mds.	1943-44
Sugar	6485	12207	Food Grains	66002	65173
Gur	—	33	Minor agricultural products.	26469	12677
Salt, Cement and Soda	31910	24349	Oil Seeds.	34648	54569
Cloth and yarn	1477	—	Gur	2788	25121
Tobacco	1171	27508	Cotton	2490	2436
Kirana	4686	254622	Ghee	1191	1711
Brass, Bronze and Metals	978	92985	Oil	166	68
			Wool & Hemp	6045	3230
	IN RUPEES			IN NUMBER	
Machinery, furniture, medicines, stationery, etc.	51192	103044	Cattle & fowl	7511	847
Gold and Jewellery	7273	215790	Hides & Skins	21833	27875
				IN TOLAS	
Arms and Ammunitions Silver	893327	241422	Silver	3194	6172
	TOLAS	TOLAS	Gold	216	22
Kerosene	19671	2756			
	TINS	TINS			
Petrol & Mobil oil	2090 gls.	792 gls.	Miscellaneous	7511	847
Miscellaneous	621	1389			

REALISATIONS –(A) A similar comparative statement showing the total realisations of Customs revenue is given below —

	Head		1942-43.		Year 1943-44.	Remarks
1	Export Duty	Rs.	3,24,684/-	Rs	4,30,457/12/-	
2	Import Duty	Rs	76,049/-	Rs.	1,00,474/ 1/ 3	
3	Kanta Hak	Rs	25,413 -	Rs.	33,741/ 8/10	
4	Fines & forfeitures	Rs	5,596/-	Rs	14,082/ - -	
5	Contribution from Chuugi Hak	Rs	1,530 -	Rs.	1,964/ -/-	
6	Motor Monopoly Income	Rs	21,239 -	Rs.	21,122/ 8/-	
7	Road tax	Rs	14,181 -	Rs.	15,634/ -/-	
8	Miscellaneous		—		—	
	Total . .		4,68,692/-		6,17,475/14/ 1	

(B) The comparative statement of the total realisations of Chungi, Jhunpi and Grazing & Forest which are collected through the Customs Department and credited to the Municipality and the District Board, the Revenue Department and the Forest Department respectively is given below:-

Head	Year 1942-43.	Year 1943-44.	Remarks.
1. Chungi	Rs. 50,633 -	Rs. 39, 174 -	Credited to the Municipality.
		Rs. 27,490 -	Credited to the Dist. Board.
2. Jhunpi	Rs. 25,413 -	Rs. 33 737 -	
3. Grazing & Forest	Rs. 8,929 -	Rs. 10,055 -	
Total...	84,975 -	1,10,456 -	

Out of the total amount of Chungi collected through the Customs Department, the Department receives 3% as collecting charges from the Municipality and the District Board. The comparative statement of the amount realised in the year under report and the preceding year is as under:-

Year	amount realised.
1942-43	Rs. 1,530 -
1943-44	Rs. 1,964 -

CUSTOMS OFFENCES AND THEIR JURISDICTION.—The Superintendent of Customs and Excise is empowered under section 19 of the Customs Kawayad, Banswara State to decide smuggling offences wherein the offender confesses the guilt and chooses the option of getting his case decided by the Superintendent. The maximum punishment the Superintendent is authorised to impose under the above mentioned section is the confiscation of the smuggled goods or the realisation of its price. Except in the above circumstances, all cases of Customs offences are to be challaned before the First Class Magistrate with the previous permission of the Dewan.

A comparative statement, the number of smuggling offences instituted and the fine imposed in the year 1942-43 and 1943-44 is given below:-

Year	Number of cases.					Fines.				
	Pending	Instituted.	Total	Disposed of	Balance	Outstanding.	Imposed during the year.	Total.	Realised.	Balance.
						Rs.	Rs.	Rs.	Rs.	Rs
1942-43	26	320	346	298	48	11,342	5,270	16,612	5,108	11,504
1943-44	48	492	547	462	73	11,504	16,253	27 757	13,045	14,712

MOTOR MONOPOLY CONTRACT:—The administrative control of motor monopoly contracts vests with the Customs Department and the Superintendent of Customs is empowered to deal with cases of breach of terms of the agreement and the offences under motor vehicle acts as far as the monopoly contractors are concerned. The total revenue from the motor monopoly tax and the license fee has been under item No. 6 of the statement under "Realisations" above.

SALE OF STAMPS:—The Customs Nakedars in the districts are also entrusted with the work of selling stamps for which they are paid a fixed remuneration. The total value of sale through the Nakedars amounted to Rs. 353/7/-under report as shown against Rs. 368/7/- in the previous year.

EXCISE SECTION.

DISTILLERY:—The Distillery is State-owned and State-managed and is under the administrative control of the Superintendent of Customs and Excise.

Mr Harishanker Joshi, B. A. in his capacity as the Distillery Inspector and Mr. Laxmishanker Nagar in his capacity as the Distillery Engineer are entrusted with the work of distribution and manufacture of liqour respectively.

Liquor is directly supplied from the Distillery to the licensed vendors for sale on commission basis.

There is only one central Distillery in the State and in respect of manufacture and supply the Madras system in its entirety is in vogue

The statement given below gives details of manufacture and issue of liquor during the year under report as compared with the previous year.–

Details	Year 1942-43				Year 1943-44			
	60° U. P	25° U. P	Spiced liquor.	Dubara of Gur & Spiced liquor 25° U P	60° U. P.	25° U P	Spiced liquor.	Dubara of Gur & Spiced liquor 25° U
	Gls.	Gls	Bottles	Bottles.	Gls.	Gls,	Bottles	Bottles
1 Opening Balance ..	1771	90	14	64	693	89	33	86
2 Distilled during the year ..	98234	4136	1336	355	111290	4024	879	361
3 Increase due to Reducing .	..	..	.	...	20	..	..	.
Total ..	100005	4226	1350	419	112003	4113	912	447
1 Supplied to shops ...	96614	3904	1276	333	109083	3795	764	249
2 Raturned to redistillation	2060		..		120	75	.	.
3 Used in preparing spiced liquor .	...	211		...		141	.	..
4 Issued in doles... .	512	.	.	..	528	.		
5 Supplied for festivals ..	55	...	41	..	70gls. 5bts	4b.	57	
6 Driage and wastage .	71	22	...	...	131,, 1 ,,	17gls 2b		.
Total Issue ..	99312	4137	1317	333	109933	4029	821	249
Closing Balance ..	693	89	33	86	2070	84	91	198
Graud Total ..	100005	4226	1350	419	112003	4113	912	447

RATES:—The selling rates of liquor of 60° U. P. rose from four annas to ten annas per bottle The selling rates of 25° U P. were double than those of the 60° U P

LIQUOR SOLD —The quantity of liquor sold during the year as compared with the previous year is shown in the following table .

Year	60 U P.	25 U. P.	Spiced liquor	Dubara of Gur 25 U. P.	Dubara of Spiced Gur	Value
	Gls	Gls.	Gls.	Bottles	Bottles	
1942-43	104130	4129	1717	328	191	1,57,460/-
1943-44	109929	3335	738	153	99	2,35,815/-

The amount realised and the amount outstanding from the licensees is shown in the following table:-

Year	Outstanding at the beginning of the year.	Value of liquor supplied during the year.	Total.	Realised during the year.	Balance at the close of the year.	Value of liquor in stock at the close of the year.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1942-43	13,776/-	1,46,944/-	1,60,720/-	1,57,442/-	3,278/-	2,436/-
1943-44	3,278/-	2,33,127/-	2,36,405/-	2,33,688/-	2,717/-	2,311/-

IMPORTANT CHANGE.

The commission systen for the sale of liquor had been partially introduced in the previous year. This year the commission system was introduced throughout the State on a uniform basis.

There were four posts of cash-collectors with one peon each provided in the budget of the Distillery. The only duty of these officials was to collect sale proceeds of liquor from the licensed shops and deposit the same in the Distillery. This item of expenditure appeared to be superfluous and was abolished and the work of collection of the sale proceeds has been arranged either through the Custom's Nakas or directly through the shop-keeper in the distillery. This saving has been utilised to strengthen the preventive staff.

LIQUOR SHOPS: ..The total liquor shops in the year under report were 87 as against 86 in the previous year. One new shop at Jaldan was opened while the Khodan shop was shifted to Metwala.

LICENSE FEES:...Licenses for sale of liquor are granted by open auction held each year in the month of September before the Superintendent of Customs and Excise. The total auction fee this year amounted to Rs. 19,436/- as against Rs. 13, 757/- in the previous year.

RECEIPTS AND EXPENDITURE;...The total receipts, expenditure and net income of the Distillery during the year under report are given below and are compared with those of the previous year:-

Heads of Income	1942-43			1943-44			Remarks
	Receipts	Expenditure.	Net Income	Receipts	Expenditure.	Net Income	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
1. Manufacture of liquor	60,372/-	20 511/-	39,861/-	66,008/-	38,071/-	27,937/-	
2. Sale of liquor	98,101/-	10,205/-	87,896/-	1,67,680/-	14,835/-	1,52,845/	
3. Miscellaneous	102/-	-	102/-	130/-	-	130/-	
Total......	1,58,575/-	30,716/-	1,27,859/-	2,33,818/-	52.906/-	1,80,912/	

OFFENCES UNDER EXCISE LAW, OPIUM AND INTOXICATING DRUGS ACT AND HEMP DRUGS ACT:...Offences under Excise Law, Opium and intoxicating Drugs and Hemp Drugs Act are decided by the Dewan in his capacity as the Chief Excise Authority. Such cases are also challaned in the law courts when so ordered by the Dewan.

A comparative statement of the cases instituted under Excise Law, Opium and Intoxicating Drugs Act and Hemp Drugs Act and the fine imposed in the year under report and the previous year is given below:—

Offences relating to	Yaer	Number of cases. Pending	Instituted.	Total	Disposed of	Balance	Outstanding.	Amount of fine or compensations Imposed during the year	Total	Realised.	Balance.	REMARKS.
1. Abkari	1942-43	4	103	107	104	3	1216	3843	5059	3592	1467	
	1943-44	3	180	183	181	2	1467	5775	7242	5440	1902	
2. Opium	1942-43	-	1	1	1	-		Challaned to Court				
	1943-44	-	1	1	-	1	-	-	-	-	-	
3. Bhang	1942-43	-	2	2	2	-	-	15	15	15	-	
	1943-44	-	1	1	1	-	-	4	4	4	-	
4. Ganja	1942-43	-	3	3	3	-	-	25	25	25	-	
	1943-44	-	4	4	4	-	-	8	8	8	-	

EXCISE REVENUE.—The total income of the Excise Department under various heads during the year is compared with the previous year in the following table.-

	Heads.	1942-43 Rs	1943-44 Rs	Remarks.
1	Distillery	1,58,473/-	2,33,688/-	
2	Opium	51,154/-	62,831/-	
3	Bhang & Ganja	2,787/-	3,540/-	
4	License fees	15,731/-	21,926/-	
5	Match excise duty			
6	Fines and forfeitures	3,541/-	5,396/-	
7	Miscellaneous Distillery.	102/-	130/-	

OPIUM BHANG AND GANJA DRUGS.—Opium Bhang and Ganja are produced locally and are also imported from outside for internal consumption The following table shows the quantities of these drugs imported during the year—

Drugs	From where imported	Quantity Mds.	Srs	Chh	Tolas	Remarks.
Opium	Indore	65	..		.	
Bhang	Partabgarh	3	..	...		
Ganja	Sanawad	5	...	.	.	

SALE ARRANGEMENTS.—Opium is sold by Customs Nakedars and by licensed vendors who are given commission on the sales effected by them It was sold during the year at 16 Nakas and by 42 licensed vendors. New opium shops at Varetha and Chhayana were opened during the year while one shop at Gamdi was closed.

Bhang and Ganja are sold by licensed vendors who are allowed commission on the sales made by them The total number of shops at the close of the year was 29, of which 3 new shops of Ganja were opened at Varetha, Chhayana and Gamanamoti during the year under report. These drugs are also sold at 15 Nakas.

SALES:—The following table shows the total quantities of opium, Bhang and Ganja sold during the year under report:—

Drugs	Quantity. Mds.	Srs.	Chh.	Tolas.	Remarks.
1 Opium	90	36	3	4	
2 Bhang	26	21	5	0	
3 Ganja	4	36	5	1	

FOREST & MINES DEPARTMENT

ADMINISTRATIVE DIVISIONS:—The forests of the State are divided into the following ranges:—

1. Banswara-Anas.
2. Mahi-Arao.
3. Town Block.

FOREST CHOWKIS:—The forest area in the State has been divided into 32 beats and each is to be placed under the Forest Guard. A group of such beats is assigned to a headguard. Twenty one of these posts were manned during the year and there were two extra outposts in addition to them.

FOREST PILLARS:—The following table gives the details of the cairns maintained during the year under report as compared with the previous year:—

Name of Range	Number of pillars maintained 1942-43	1943-44
Banswara- Anas	1,982	1,982
Mahi Arao	1,426	1,426
Town Block	865	865
Total	4,273	4,273

FIRE LINES:—Fire lines were cleared or burnt as follows:—

(a) Mahi - Arao—Shikargah Pipalkhunt.

(b) Banswara-Anas—Jhupel-Bildi-Vichhawara.

ROYAL TREES:—Sag, Timru, Khajur and Mahuwa continued to be treated as "royal trees" during the year under report.

ORGANISATION AND IMPROVEMENT OF FORESTS:—During the year under report [illegible] thinning operations were taken in hand with the exception of a small [illegible] in Range Mahi-Arao which was given over locally [illegible].

FOREST REVENUE AND EXPENDITURE:—The Forest Revenue for the year [illegible] with that of the previous one is stated below:—

Heads of revenue	1942-43	1943-44
1 Timber and other produce removed by State Agency		
(a) [illegible]	-	-
(b) Firewood & Charcoal	[illegible]	[illegible]
(c) Grass [illegible]	[illegible]	[illegible]
(d) Miscellaneous	-	-
Total ...	[illegible]	[illegible]

2. Timber and other produce removed by consumers:-		
(a) Royalty and Export	15816	29143
(b) Firewood & Charcoal	1553	3244
(c) Plough Tax	27031	29667
(d) Grazing fees	8822	8381
(e) Miscellaneous	2624	3347
Total......	65743	74782
3. Mines & Industries:-		
(a) Quarries	4217	4083
(b) Mines	1888	4136
Total......	6105	8219
Grand Total......	65743	86229

The expenditure on the forest department amounted to Rs 14,147/- as against Rs. 13,834/- in the previous year.

MUAFI AND CONCESSION PASSES:-During the year under report the muafi and concession passes which were formerly issued to the bhils and cultivators under Forest Rules were stopped due to the introduction of the Hal Tax Scheme last year. Muafi passes have been issued only to the State departments for ordinary timber from the Forest Department and for royal trees under special sanction. No duties are levied on the collection of minor forest produce like gum, lac, honey, wax, etc. Offences relating to unauthorised fellings, poaching and fire are dealt with under the Forest and Shikar rules. They are compoundable by the Conservator of Forests on compensation upto Rs. 50/- but where higher punishments are necessary such cases are generally challaned before the Judicial Court The following statement gives the details of the forest cases including shikar and fire offenses reported and disposed of departmentally by the Conservator of Forests during the year under report:-

Last year's Balance	This year reported.	Total	Disposed of during the year	Balance at the end.
341	490	831	356	475

During the year under report no case was challaned to be tried under magisterial powers of the Conservator

GAME PRESERVATION & PATROL:—This section remained under the charge of Maharaj Sahib Narpat Singhji during the year under report as usual.

GRASS DEPOT:-There is a central Hazira Depot for the management of grass, firewood, and charcoal at the capital from where supplies are made to the State departments. Baling operations of grass was also undertaken during the year under report at both-in the capital and the districts. The following statement gives the details of grass, firewood and charcoal collected and disposed of at the Central Depot during the year under report:—

Heads	Grass in maunds.	Fire wood in Manis	Charcoal in maunds.
Opening Balance	2980	43	20
Received during the year	9183	1728	544
Total .	12118	1771	564

Heads	Grass in maunds	Firewood in Manis	Charcoal in maunds
Supplied to:—			
State Depts	7166	1658	255
Public	2109	41	149
Given gratis to Cartmen	1092	...	...
Wastage	...	...	...
Tatal...	10367	1699	404
Closing Balance	2250	72	160

Besides the above supplies, the following cart loads were supplied to the Karkhanejats:—

1	October 1943	93
2	Aug.—Sept. 1944	186
		279

The total income and expenditure of grass depot amounted to Rs. 3,258/-and Rs. 3,161/-respectively.

RESERVE GRASS:—During the year under report the work of the reservation of grass was taken in hand and it was baled as below:—

No.	Name of Centre	Grass in maunds	Number of Bales	Average
1	Banswara	114	57	Rs. 14/-
2	Jamboi	1194	597	Rs. 89/-
	Total...	1308	654	Rs. 103/-

DEPARTMENTAL SALE OF GRASS:—During the year under report departmental sale of grass was also undertaken at the centre named below:-

No.	Centre	Pulas	Rate	Income	Expenditure	Profit
1	Naljagmer	19000	Rs. 3/- per thousand	Rs. 57/-	Rs. 8/-	Rs. 49/-

GENERAL:—The Mines and Industries Department continued to be classified and worked as a part of the Forest Department. During the year under report the leases and licenses as shown in statement below were granted and cancelled:—

No.	Name of the firm working	Name of mineral	Name of place	Licenses or leases	Details
In force at the Beginning of the year.					
1	Messrs Indian Minerals Ltd. Maihar C. I.	Soapstone	Monopoly	Lease	
2	Mr. L. R. Joshi Betulganj Betul C. P.	Graphite	Bhundki ghati	Lease	
3	Messrs South Rajputana Minerals Co., Nagpur.	Ironpyrite	Nahtelao	License	

No.	Name of the firm working	Name of mineral	Name of place	Licenses or leases	Details
		Granted during The year			
4	Seth Kachorimal Sukhlal Chindwara C. P.	Galena	Karabilia	License	
5	Messrs Indo. American Mining corporation Delhi	Manganese	Kalakhuta	Lease	
6	Seth Kachorimal Sukhlal Chindwara C. P.	Manganese	Ghatia-Sobania	Lease	
7	Do	Do	Pandwal-Omkar	Lease	
		Termination during the year.			
8	Messrs South Rajputana Minerals Co., Nagpur.	Ironpyrite	Nathelao	License	Period ended.

GEOLOGICAL SURVEY.—Almost all the important minerals found in the State have been prospected by qualified Geologists appointed by the State and technically analysed. Some of them have been experimented upon with encouraging results. Discriptive List of Minerals was supplied to the prospective firms on demand.

During the year under report, the Geological Survey of Khandu Jagir was undertaken by the Department and it was carried out by Mr L R. Joshi, Geologist and Mineral Expert under sanction of the Dewan The report thereof has been compiled

MEDICAL DEPARTMENT.

STAFF:—Dr. R M Kotasthane was the Chief Medical Officer during the year under report.

Dr V. P Handa was the Medical Officer in charge of the in-door patients and the Store Department.

Dr. S. N Gupta was the Medical Officer in charge of out-door department of the State Hospital.

Dr. N. C Mukerjee was the Medical Officer in charge of the Town Dispensary.

The Rural Dispensary, Bagidora remained in the charge of Vaidya Deep Shankar.

The Rural Dispensary, Ghantol, remained in the charge of Viadya Vishwanath

A new post of a Mid-wife was created and Mrs. D P. Amanna was appointed to it

OUT-DOOR PATIENTS:—The total number of out-door patients treated in the State was 71, 983 as against 69,306 of the last year. Out of these 34,931 were treated in the State Hospital. 14,509 in the Curzon Wyllie Hospital. Garhi, 5,740 in the Bagidora Dispensary and 6,803 in the Ghantol Dispensary as compared with 32,363, 11,175, 5,760 and 11,058 respectively.

IN-DOOR PATIENTS:—The total number of in-door patients treated in the State was 556 as against 554 of the last year. Out of these 514 were treated in the State Hospital as against 535 of the last year; and 42 were treated in the C. W. Hospital as against 9 of the last year.

Of the 556 patients treated in the in-door, 438 were cured 23 relieved, 46 discharged otherwise, 11 died and 38 remained under treatment at the close of the year.

ACCOMMODATION:—There is accommodation for 32 beds in the State Hospital

DAILY AVERAGE:—The daily average of out-door and in-door patients was 47,363 as against 38,418 of the last year.

OPERATION:—Total number of operations Major and Minor performed in the State was 2,278 as against 2,421 of the last year. Out of these 1801 were performed in the State Hospital 288 in the C. W. Hospital, 96 in Bagidora and 91 in Ghantol.

DISEASES:—The diseases most prevalent in order of frequency were Malaria, diseases of the eyes and the ears, and the respiratory and digestive systems.

During the year under report 18,930 male and 22,831 female children received treatment in out-door department of the State Hospital.

INJECTIONS:—During the year under report 2,809 injections were given as against 1,938 of the last year.

MEDICOLEGAL:—During the year under report 28 post Mortem Examination and 110 Medicolegal Examinations were done in the State Hospital.

EPIDEMIC:—During the year under report as a result of preventive measures, no epidemic disease broke out in the State.

FREE DIET;—Free diet was supplied to the poor in-door patients in the State Hospital and Rs. 200/2 6 were spent on this account.

EXPENDITURE:--The total expenditure of the State Hospital and Garhi Hospital was Rs 29,134/15 9 and Rs. 2,668/3 9 respectively in the year under report.

EDUCATION DEPARTMENT.

CHARGE,—The Department of Education was under the control of the Dewan who acted as the Director of State Education. The routine work and supervision were done by Mr. C. C. Chatterji, B.Sc.,LL.B.,B.T., the Headmaster of King George V High School, Banswara.

The number of students on roll in the Khalsa and Jagir Schools was 2,304 as against 2,180 in the previous year.

SCHOLARSHIPS:—Scholarships of a total value of Rs. 1,971/- were given to the students for higher education.

The number of students on roll in King George V High School and the City Branch School was 244 and 541 respectively as against 225 and 579 in the previous year. The average attendance was 843 including the City Branch School.

HIGH SCHOOL EXAMINATION RESULTS·—19 candidates were sent up for the High School Examination of the Rajputana Board of whom 16 were declared successful. Of these, 9 were placed in the second and 7 in the third division. 6 students obtained distinction in Anatomy Physiology and Hygine and 1 in Mathematics.

THE PERCENTAGE OF PASSES:—The percentages of passes in the annual examination of the King George V High School and the City Branch School were 77 and 72 respectively.

CITY BRANCH SCHOOL:—The Branch School continued to be under its separate Headmaster, Pt. Devishanker Nagar. M. A.

The number of students on its roll was 541 as against 579 in the previous year. The percentage of passes of the annual examination was 72 The daily average attendance was 470

The number of teachers in the City Branch School during the year under report was 14 including the Headmaster, of whom one is an M A., one is a B. A, five are Intermediates, four matriculates, and three are Non-matriculates.

MAHARANI KANYA PATHSHALA.—Mrs. Saraswati Ojha, B. Sc, worked as Headmistress. The number of girls on its roll was 122 as against 126 in the previous year The average result of the annual examination was 53 as against 49 in the previous year. Besides the ordinary school work sewing, embroidery, knitting and cooking are also taught.

VILLAGE SCHOOLS.—At the beginning of the year Pt Narain Lal worked as Inspector of Village Schools. Later on he was succeeded by Pt. Govind Lal Trivedi, B A., of the City Branch School and Pt. Narain Lal Trivedi was transferred to the Branch School. The Inspector of Village Schools as usual carried out the periodical inspections and examinations of the village schools. A sum of Rs 1,000/- was sanctioned for the constructions and repairs of the village schools in the P. W. D. Budget. The number of boys on roll in the Khalsa village schools was 737 as against 655 in the previous year.

EXPENDITURE.—The amount sanctioned for expenditure on the Education department in the year under report was Rs. 23,436/- as against Rs 21,772/- in the previous year.

MUNICIPALITY.

MUNICIPAL BOARD:—The Municipal Board for the town of Banswara is constituted under the Municipal Act of 1939 some sections of which have been amended during the year 1941-42

CONSTITUTION:—The Board consists of 23 members of whom 9 are nominated by His Highness' Government and 14 are elected from the different wards of the town. The Dewan is the ex-officio President. The Vice-President is nominated by the Mehakma khas.

SECRETARY:—Pt. Ganesh Nath G. Purohit continued to work as the Municipal Secretary.

MEETINGS —One meeting of the General Board and a number of meetings of the Sub-committees were held during the year.

GRANTS-IN-AID:—The Board paid grants-in-aid of Rs. 75/-, Rs. 48/- and Rs. 225/- to Fakhriyah Madarsa. Mrs. Hamilton Fund and the Hamilton Library respectively.

AYURVEDIC AUSHDHALAY:—The Board runs a free Ayurvedic Aushdhalaya under a qualified Vaid. During the year under report 28,550 patients were rendered free treatment as against 32,120 in the previous year.

STREET LIGHTING:—The Municipality maintains 158 electric lights in the town for lighting the streets.

INCOME & EXPENDITURE:—The year opened with a cash balance of Rs. 8,106/-and the receipts from all sources amounted to Rs. 45,088/- bringing the total to Rs. 53,194/-. The expenditure during the year under report amounted to Rs. 26,954/- leaving a closing balance of Rs. 26,240/-.

DEBTS:—The Municipality has cleared off all its debts incurred from the State and the Thikana of Garhi.

The Municipality was paid the whole of the Chungi Tax (Octroi) collected in the State, until 1st December 1943, after which Chungi Tax collected only at Banswara town was given to it.

BIRTHS & MORTALITY:—The number of births and deaths recorded in the town was 89 and 94 respectively as against 42 and 102 in the previous year while the number of births and deaths recorded in the districts was 2,982 and 3, 037 as against 2,887 and 3,185 respectively in the previous year. Thus the number of births in the town increased by 47 while it increased in the districts by 95, as compared with the previous year. The number of deaths decreased by 8 in town whereas in the districts it decreased by 148 as compared with the previous year.

The ratio of births and deaths per thousand of the population worked out at 11 and 13 as against 10 and 13 in the previous year.

PUBLIC WORKS DEPARTMENT.

EXPENDITURE:—The total expenditure of the Public Works Department amounted to Rs. 56,592/- as against Rs. 42,649/- in the previous year as classified under:-

(i) Original works:—		
(a) Buildings	Rs.	40,614/-
(b) Roads	Rs.	6,558/-
(c) Irrigation works	Rs.	300
(ii) Repairs:—		
(a) Buildings		
(iii) Establishment	Rs.	6,189/-
	Rs.	56,592/-

ROADS:—On the 38 mile Banswara-Jhalod Road, the culverts of miles number 21 and 37 were repaired. The work of re-metalling of 6 miles was done from mile No. 35 to 38 and 20 to 21. The repairs of the approaches to the Anas Bridge were also done. For ordinary work and repair of the road there is a permanent staff of 1 mistri and 4 gangs.

REPAIRS;—Repairs included ordinary repairs and minor additions and alterations to the various State Buildings and the Palaces.

APPENDIX A.

Statement of Financial War Effort in the Banswara State during the year 1943-44.

Name of Funds	Total collections till the close of previous year.	Received during the year.	Total	Remitted till the close of the year	Remitted during the year	Balance on 1st Oct 1945	Total
	Rs	Rs.	Rs.	Rs	Rs	Rs	Rs.
Indian Red Cross .	5142 13 1	903 6 3	6046 3 4	3884 3 0	2161 0 4	1 0 0	6046 3 4
H. E 's War Purposes Fund .	37712 15 5	1035 7 10	38748 7 3	31896 0 0	6212 7 0	640 0 3	38748 7 3
Silver Trinket Fund	154 10 3 (& Silver 338 Tolas)	.	154 10 3 (& Silver 338 T.)	154 10 3 (338 T S)		.	154 10 3 (338 T. S)
St Duston's Fund ..	500 0 0	..	500 0 0	500 0 0			500 0 0
War Fetes through Mrs Lothian, Abu .	200 10 3		200 10 0	200 10 3			200 10 3
Win the War Luck Fund	1929 13 6		1929 13 6	1929 13 6	.	..	1929 13 6
Lord Mayor's Fund	200 0 0		200 0 0	200 0 0	..	.	200 0 0
War Loans .	19763 7 0	31220 0 0	50983 7 0	19763 7 0	31220 0 0		50983 7 0
A C E. S. Fund .	500 0 0	1493 4 0	1993 4 0	500 0 0	1493 4 0	.	1993 4 0
Ambulance Car .	3275 0 0		3275 0 0	3275 0 0			3275 0 0
Thrift Shop	250 9 0 (& 17¾ Tola silver & 1 B Pot)	31 4 0	281 13 0 17¾ T S & 1 B P	250 9 0 17¾ T S & 1 B P.	31 4 0		281 13 0 17¾ T S 1 B P
Royal Air Force		70 0 0	70 0 0	70 0 0		.	70 0 0
TOTAL	69629 14 6 & 355¾ Tola Silver & 1 B Pot.	34753 6 1	104383 4 4 & 355¾ Tola Silver 1 B Pot	62624 5 0	41117 15 4	641 0 3	104383 4 4

APPENDEX B.

Statement Showing Cases disposed by the High Court in the year 1943-44

Nature of Cases	Year	Pending from last year	Filed during the year	Total	Disposed of during the year							Pending at the close of the year	Remarks
					Confirmed	Reversed	Amended	Remanded in retrial	Compromised or otherwise disposed of	Transferred	Total		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Civil appeals	1942-43	2	9	11	9	1	...	...	...	...	10	1	
	1943-44	1	3	4	4	...	...	...	...	...	4	...	
Civil Revisions	1942-43	11	29	40	15	5	1	10	1	...	32	8	
	1943-44	8	14	22	13	3	3	...	...	...	19	3	
Civil Review	1942-43	...	...	...	...	...	...	...	...	...	...	...	
	1943-44	...	...	...	...	...	...	...	...	...	...	...	
Criminal Appeals	1942-43	6	12	18	11	3	3	...	...	...	17	1	
	1943-44	1	2	3	1	1	...	...	...	...	2	1	
Criminal Revisions	1942-43	11	4	15	10	1	2	1	...	...	14	1	
	1943-44	1	9	10	7	2	1	...	...	...	10	...	
Committed from Sessions Court	1942-43	1	3	4	...	1	...	...	1	...	2	2	
	1943-44	2	...	2	...	2	...	...	...	...	2	...	
Lawarish Appeals	1942-43	...	...	...	...	...	...	...	...	...	...	...	
	1943-44	...	...	...	...	...	...	...	...	...	...	...	
Lawarish Revisions	1942-43	...	2	2	...	2	...	...	...	...	2	...	
	1943-44	...	...	...	...	...	...	...	...	...	...	...	
Miscellanious	1942-43	...	4	4	2	2	...	...	...	...	4	...	
	1943-44	...	3	3	3	...	...	...	...	...	3	...	
Criminal References	1942-43	...	2	2	1	1	...	...	...	...	2	...	
	1943-44	...	1	1	1	...	...	...	...	...	1	...	

APPENDIX C.

Statement showing the case work of the District and Sessions Court Banswara during the year 1943-44.

Nature of Cases dealt with	Year.	Pending	Instituted	Total	Disposed of: Confirmed	Modified	Rejected	Sent for retrial	Total	Pending at the close of the year	Remarks
1	2	3	4	5	6	7	8	9	10	11	12
Criminal Original Cases											
Sessions Cases	1942-43	12	29	41	.			.	41	.	
	1943-44	..	23	23		.	.	..	22	1	
Criminal appeals											
(1) First Class Magistrate Northern Division	1942-43	..	8	8	2	3	1	..	6	2	
	1943-44	2	20	22	14	5	2	1	22	...	
(2) First Class Magistrate Southern Division	1942-43	.	3	3	.	1	1	.	2	1	
	1943-44	1	5	6	4	1	1		6		
(3) Second Class Magistrate Khandu	1912-43	..		.						..	
	1943 44	.			.					.	
Criminal Revisions											
(1) First Class Magistrate Northern Division	1942-43	..	4	4	2	1	1	..	4		
	1943-44	...	5	5	3		1		4	1	
(2) First Class Mgaistrate Southern Division	1942-43	...	5	5	4				4	1	
	1943-44	1	4	5	5				5		
(3) Second Class Magistrate	1942-43	.	.	..				.	.		
	1943-44	.		.			..		...		
Civil Original Cases											
Civil Suits	1942-43	3 / 13667	1 / 3568	4 / 17235					1 / 3960	3 / 13275	
	1943-44	3 / 13275	1 / 3849	4 / 17124					2 / 7656	2 / 9468	
Civil appeals											
(1) Civil Judge	1942 43	4	15	19	13	5	.	...	18	1	
	1943-44	1	18	19	11	2	3		16	3	
(2) Munsif Court Khandu	1942-43	..		.	..			...	.		
	1943-44	..	.	.	.	..	.	...	...	.	
Criminal appeals Decided as Additional District Magistrate											
(1) F C. Magistrate N D.	1942-43	..									
	1943-44	...	3	3	2	1	...	...	3	...	
(2) F. C. Maigstrate S D	1942-43	..									
	1943-44	.	3	3	..	1	2	...	3	...	

APPENDIX D.

Statement Showing Receipts and Disbursment

	RECEIPTS.	Actuals for St. 1999 1-10-42 to 30-9-43	Budget Estimate for St. 2000 1-10-43 to 30-9-44	Actuals for St. 2000 1-10-43 to 30-9-44	Remarks.
	Opening Balance ...	3,37,281	8,06,059	8,06,059	
	INCOME ORDINARY				
I	Land Revenue ...	3,66,996	3,50,037	3.98,787	
II	Forests ...	59,658	57,300	78,010 −2	
III	Mines and Industries ...	6,104	12,300	8,219	
IV	A. Customs ...	4,33,272	2,18,250	6,08,209	
V	B. Excise ...	2,52,399	2,43,039	3,50,892	
VI	Judicials ...	11,429	10,700	15,486	
VII	Stamps ...	19,409	18,500	23,967	
VIII	Registration ...	540	550	578	
IX	Interests ...	2,461	2,414	2,840	
X	Miscellaneous ...	73,166	69,086	92,289	
XI	Electrical ...	...	23,075	26,797	
	Total Ordinary ...	12,25,434	10,05,251	16,06,074 −2	
	EXTRA ORDINARY				
XII	Land Revenue (Marriage Com.) ...	11,139	10,000	19 281 +2	
XIII	Miscellaneous ...	...	9,000	8,901	
	Total Extra Ordinary ...	11,139	19,000	28,182 +2	
	Total Ordinary & Extra Ordinary ...	12,36 573	10,24,251	16,34,256	
II	Loans and Cash Refund ...	1,93 195	1,64,041	9,40,696	
	Total of I & II ...	14,29,768	11,88,292	25,74 952	
III	Deposits ...	2,46,401	9,527	4,99,143	
	Grand Total ...	16,76,169	11,97,819	30,74,095	
	Grand Total Including Opening Balance ...	20,13,450	20,03,878	38,80,154	

of the Banswara State for the year 1943-1944.

	DISBURSEMENTS		Actuals for St. year 1999 1-10-42 to 30-9-43	Budget Estimate For St. yr. 2000 1-10-43 to 30 9-44	Actuals for St. year 2000 1-10-43 to 30-9-44	Remarks.
I	H H's Privy Purse	...	86,400	86 400	83,503	
II	Maharaj Raj Kunwar Sahib	...	10,200	10 200	9,350	
III	Zanani Deodi	...	42,680	42,660	42,944	
IV	Palace Staff	...	2,782	4,612	4,086	
V	Ijlas Alia	...	780	2 458	1,383	
VI	Foreign Tribute	...	17,521	17,525	17,500	
VII	Mahakma Khas	...	18,009	25 594	21,647	
VIII	Record office	...	1,290	1 339	1,326	
IX	Accounts office	..	6,746	7,582	6,931	
X	Court of Wards	...	3,237	2,981	1,407	
XI	Revenue Department	..	39,174	47,126	41,144	
XII	Forest Do	...	11 831	19 489	14,134	
XIII	Mines and Industries	...	1,996	5 932	1,148	
XIV	A. Customs Department	...	16,783	24,924	22,380	
	B Exise Do	...	30,716	53,821	52,906	
XV	Law & Justice	...	23,615	27 313	25,421	
XVI	Registration	..	271	275	289	
XVII	Police Department	...	30,215	39,078	31,202	
XVIII	Military	..	27,414	27 840	21,921	
XIX	Medical	...	31 221	32 530	29,925	
XX	Education	...	21,766	27,236	22,694	
XXI	P. W. D.	...	42,648	1,02,264	56,592	
XXII	Stables, Garage & Dairy	...	47,394	50 766	44,145	
XXIII	Guests & Deputation	...	15,525	14,093	13,271	
XXIV	Electrical Department	...	.	50 716	16,091	
XXV	Light, Water Supply & Telephone	...	14,013	14 804	13,872	
XXVI	Ceremonials	...	55 786	79 913	76,038	
XXVII	Charities	...	5,656	7,200	5,776	
XXVIII	Press & Stationery	...	5,348	7,090	6,474	
XXIX	Gardens	...	13,943	13,996	11,316	
XXX	Contribution & Donation	...	16,131	14 249	5,387	
XXXI	Compensation	...	16,268	27 193	26,517	
XXXII	Special Pension	...	2,767	2,670	2,666	
XXXIII	Providend Fund & Interests	...	1,481	3,600	2,696	
XXXIV	Fomine Fund	...	5,000	10,000	10,000	
XXXV	Miscellaneous	...	14,206	15 483	8,236	
XXXVI	Medical Expences	..	...	67,450	67,128	
	Total	..	6,80,813	9 88 271	8 19 646	
II	Loans & Cash Advances	...	3,37,354	1 41 500	9,99 386	
	Total of I & II	...	10,18,167	11 29 771	18 19 032	
III	Refurds from Deposits	..	1,89,224	1,89,240	4,39,167	
	Total of I, II & III	...	12,07,391	13 19,011	22 58 199	
	Closing Balance	...	8,06,059	6 84 867	16,21 955	
	Grand Total	...	20,13,450	20 03,878	38,80,154	

APPENDIX E.

Statement of Rainfall in Banswara State.

Serial No.	Stations	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	August	Sept.	Total	
1	Banswara ...	...	...	...	...	...	...	...	...	5.67	22.15	32.3	1.15	61	
2	Danpur ...	...	...	...	...	...	...	...	...	2.15	26.49	38.14	2.28	69.6	Highest
3	Bhoongra ...	...	...	...	1.6	...	...	...	...	1.30	23.45	35.18	1.52	62.51	
4	Khamera ...	...	...	...	...	...	...	...	...	2.95	26.32	36.38	2.25	67.90	
5	Jagpura ...	...	...	...	...	...	.51	.17	...	4.10	27.75	29.63	3.15	65.31	
6	Loharia ...	...	...	...	...	...	...	...	...	3.85	31.60	28 16	1.45	65.6	
7	Garhi ...	...	...	...	...	...	...	...	...	4.57	22.52	33.22	.77	61.8	
8	Arthura ...	...	...	...	1.	...	...	...	...	2.47	17.18	29.28	.27	50.20	
9	Shergarh ...	...	...	...	1.15	...	...	.25	...	5.43	19.82	20.80	.42	47.87	Lowest
10	Sallopat ...	...	...	...	1.41	...	.22	.20	...	6.51	23.96	25.51	.62	58.43	
11	Bhopatpura ...	...	...	...	...	...	...	...	...	6.69	20.24	22.15	.63	49.71	
12	Khandu ...	...	...	...	.68	...	...	...	...	5.62	17.81	29.58	1.72	55.41	
	Average ...	...	...	...		...	...	...	...	...	...	...	...	59.46	

Government of Bombay.

GENERAL DEPARTMENT.

ARCHÆOLOGY.

Progress Report of the Archæological Survey of India, Western Circle, for the year ending 31st March 1916.

PART I.

I.—DEPARTMENTAL NOTES.

Personnel.

During the year under report the only item of importance to be recorded under this head is the transference of the Assistant Superintendent, Mr. J. A. Page, to the post of the Superintendent, Muhammadan and British Monuments, Northern Circle, Agra Mr. Gordon Sanderson, Superintendent of that Circle, who had joined the I. A. R. O. and proceeded on field service, died of wounds received in an action in Flanders. Mr J F. Blakiston, Assistant Superintendent of the Eastern Circle, was appointed permanently to succeed him. But as the latter also had joined the Indian Army Reserve, Mr. Page was appointed to act for him. Mr. Page delivered over charge of his Office to me on the 24th January last, which I held in addition to my own duties until the 28th of February following. In accordance with the orders of the Government of Bombay, contained in their Notification No. 3278 of the 9th May 1916, Dr V S Sukthankar, who was a scholar in the Office of the Government Epigraphist at Ootacamund, has been appointed Officiating Assistant Superintendent of this Circle. He assumed charge of his post on the 29th February

Establishment.

2. Owing to ill health both the Head Clerk and the Second Clerk were on privilege leave, the first for one, and the second for two, months The General Assistant, also, was on privilege leave for 20 days.

II.—YEAR'S WORK.

Work at Head Quarters.

3. At the head-quarters we were all engaged upon the usual routine work, the Officers being busy with the writing out of the Report, the drawing up and the printing of the Conservation Notes, and the preparation of full and exhaustive articles for the Director-General's *Archæological Annual*, and the Establishment occupied with the completion of the drawings plotted in the field, the developing and the printing from the photo-negatives, and so forth.

Tours.

4. About the beginning of August last I was in the Gwalior territory to advise the Darbar in regard to the conservation of certain archæological monuments of importance at Surwaya (*infra*, p. 11, para. 40). The middle of November found me at Nagari in the Udaipur State where I was in camp for two months and a half engaged upon excavating the different ancient sites It was from here that I visited the fort of Chitorgarh with a view to supervise and advise my Office Photographer who was stationed at the Great Tower (*kara kirtham*) to try by some device or another to photograph the images of this monument—a work which was thought impossible to achieve, but which, I am glad to say, was successfully

accomplished by the ingenious use of reflecting mirrors (*infra*, para. 16). From Nagarī I went to Ajmer to undertake excavations in and about Arhā din-kā Jhuṁprā at the desire of the Director-General of Archæology and the Working Committee of the Rājputānā Museum, Ajmer. These and my other movements have been detailed in my Diary printed in Appendix A.

5. In accordance with Government Order No. 4561, General Department, dated the 5th June 1915, Mr. Page was in Kashmir from the beginning of June to the end of September, helping the State Engineer, Śrīnagar, in drawing up estimates, plans, etc., for the work of conservation to be undertaken at the Jāmi' Masjid which is perhaps one of the most interesting examples of wooden architecture in the world (*infra*, p. 70). During the touring season Mr. Page was at Chāmpānir, training the Archæological Sub-overseer stationed there and assisting in the operation of the grouting machine which had been brought there from England. In furtherance of the scheme of inspecting systematically all the monuments that have been declared protected, he went first to Sind, as that province had for long not been visited for conservation purposes by any archæological officer. But he had to cut short his touring there as he was suddenly called away to Agra to act for the Superintendent of the Northern Circle as stated in para. 1 above. A statement of these and his other movements will be found in the same appendix.

MUSEUMS.

Prince of Wales Museum.

6. Considerable progress is discernible this year in the acquisition of historical and archæological objects for the Prince of Wales Museum, Bombay. A list of these objects will be found in Appendix F. The most extensive and perhaps the most interesting of these is the collection of antiquities purchased from Mr. Purushottam Vishrām Mavji, consisting of old Indian pictures, maps, cloths (silk, etc.) of various kinds), arms and coins. It was acquired for Rs. 1,42,500, of which Rs. 30,000 have already been paid by Government and a further sum of Rs. 30,000 will be paid as soon as financial conditions improve. This is, indeed, a most liberal grant-in-ad made by Government to the Museum. The collection actually bought is not, however, the whole of the collection that had been exhibited at the Vishrāmbhavan by the original owner; nor does it contain any antiquities of the pre-Muhammadan period, excepting a few coins. Nevertheless, it cannot be denied even for a moment that this collection, as it is, is an invaluable acquisition and cannot fail to attract the antiquarian, historian or artist, when it is properly exhibited in the Museum.

7. In my last year's Report (p. 8, para. 25) I have stated that I examined the hoard of 2,393 Kshatrapa coins discovered at Sarvāṇiā in the Bānswāṛā State, Rājputānā, and that the new dates supplied by them are not a few, and give a more accurate idea of the durations of certain Kshatrapa reigns. Shortly after my examination of them, I represented to the Kāmdār, Bānswāṛā State, that as 100 coins from this lot had already been given to the Rājputānā Museum, Ajmer, at least 50 might be presented to the Prince of Wales Museum and that I should be allowed to make the necessary selection. I was gratified to find that he was able to prevail upon the Bānswāṛā Darbār to accede to my request. Accordingly I selected the best 50 coins, a list of which will be found in the same appendix. It will be seen from it that I was able to secure most of the coins which bore new dates. This present was, therefore, an extremely valuable one from a numismatic point of view, and I must consider it to be a fortunate circumstance that, though no less than 100 coins were taken by the Ajmer Museum, very few with new dates were among them. It will be remembered that a similar hoard of Kshatrapa coins of precisely the same period was found eighteen years ago at Uparkoṭ in the Junāgaḍh State and described by Rev. Mr. H. R. Scott in the *Journal* of the Bombay Asiatic Society. I have stated in a previous Report that so long ago as 1909 the Junāgaḍh Darbār permitted me to select the best 57 coins of this find for the Prince of Wales Museum. Thus the most important specimens from both the hoards have been acquired for this Museum, which together make a collection of Kshatrapa coins vastly superior, for he period covered by them, to that of any museum in India, and even to that of the British Museum, London.

8. Another present of coins to the Prince of Wales Museum was made by the Jambughoḍā Dārbār from the hoard found at Dhanpuri. The details of this find and its important features have been described (*infra*, pp. 28 and 60). Eleven coins were bought by me for the Museum from Mr. Billimoria of Bhuj. Seven of them belong to classes which have now become rare, and two among these are unique. One, in particular, is quite unique It belongs to Andragoras, who was appointed Satrap of Bactria by Alexander the Great. As stated in para. 23 below, this coin is not yet known to exist in any museum either in India or England.

9 In December 1914 when I was at Bhuj, Cutch, I happened to see three inscribed stones lying in the Residency Office They belonged to Colonel Jacob, who, I was told, found them, when he was Resident at Bhuj, near the Chhatris of the former Raos of Cutch not far from the Residency The letters engraved on them at once arrested my attention They bore remarkably close resemblance to the letters of the clay seals found at Harappa in the Punjāb, which look to be of a highly ornate type but which have so far defied all attempts of scholars at deciphering them At my suggestion, Colonel Jacob was kind enough to present them to the Museum. The value of these inscriptions from the palæographic point of view can scarcely be exaggerated, and my best thanks are due to the donor for this important gift

10. One historic picture originally lying at the Baroda Residency, but now secured for the Museum through the good offices of the Director-General of Archæology, deserves a passing mention. It is believed to be of Mīr Nūr-ud-dīn Husain Khān, a nobleman of high rank at the Court of Delhi, who, on the break-up of the Mughal empire, started for Mecca *viâ* Surat, but was detained there by Colonel Mallet, then Resident at Surat, who became a great friend of the Muhammadan noble. This picture appears to have been sent along with a sword by Colonel Mallet to the Resident at Baroda, for being presented to Nawāb Amīn-ud-dīn Khān of Baroda, grandson of Mīr Nūr-ud-dīn Khān, as a token of the esteem in which he had held his friend, the Nawāb's grandfather. The sword was duly presented to the Nawāb by the Resident, Mr Williams, but the portrait was apparently retained in the Residency

11. Another object acquired for the Museum also deserves to be noticed. [illegible] entrance of the Turkish Custom House [illegible] Arthur Barret was good enough to place [illegible] stone would soon become of historical interest, it was most gratefully accepted on my suggestion by the Board of Trustees

12. The Bijāpur Museum, too, has made good progress in the matter of acquiring interesting objects of the Ādil Shāhī period. Some of them were secured at my recommendation, and some were procured by F. J. Varley, Esq , I C S , when he was District Judge at Bijāpur. Mr. Varley took a keen interest in all museum matters, and would have greatly assisted in making further acquisitions, if he had not retired from service

Bijapur Museum.

13. The main cause of our being able to secure so many objects for the Bijāpur Museum this year is, no doubt, the war, which has prevented tourists from Europe and especially America from coming to Bijāpur and paying fabulous prices for moveable antiquities which, there is every reason to suppose, were formerly taken away in numbers. The result is that needy and indigent owners, who can no longer expect the arrival of such tourists, are now selling off, to the Museum, the objects they possess As early as August 1913 I had proposed at a meeting of the Museum Committee that this traffic in the Bijāpur antiquities should be stopped at once by taking the necessary steps either under section 17 or 18 (preferably the former) of the Ancient Monuments Preservation Act. Unfortunately the Committee approached Government with a view to some action being taken under section 18, who rightly doubted, as I feared, the possibility of making [illegible] in view. Accordingly at a meeting held in [illegible] attempt might now be made to see whether [illegible] ble. I am glad that my suggestion was approved, and that Government will be approached again. If Government think it fit to bring this section into force at Bijāpur, it should effectually put a stop to the exploitation of Ādil Shāhī antiquities in Bijāpur.

14. A list of the objects acquired or presented to the different museums will be found in Appendix F.

VI-VII.—LISTING OF MONUMENTS AND ICONOGRAPHY.

15. During the year under report, Mr. M. B. Garde, Inspector of Archæology of the Gwālior State, was able to devote about a month and a half to touring for 'Listing' purposes, the remainder of his touring season having to be spent at Surwāyā in exercising supervision over repairs to the monuments there, reference to which will be found below in para. 40. Brief as this period was, he was able to list "124 individual monuments distributed over 27 different places in the Gwālior Gird, Bhind, Tonwarghar and Narwar Districts." Perhaps the most interesting discovery he has made this year is that of two copper-plate charters found at Kureṭhā in the Tonwarghar district and about 40 miles north-east of Gwālior. A brief summary of their contents has been given in Part II (p. 59, para. 21 below).

16. In 1911 Dr. J. Ph. Vogel, when he was Officiating Director-General of Archæology in India, visited Chitorgaṛh and carefully inspected the Great Tower (*Barā kirtham*) built by Rāṇā Kumbha in A. D. 1448. In one of its inscriptions the tower is called *Mahāmeru-Śrī-Kīrtistambha,* 'The Tower of Fame (styled) Mahāmeru.' The Tower is thus meant to be a representation of Mount Meru, the Indian Olympus; and it is, indeed, a veritable pantheon of Hindu deities. What makes this monument exceedingly important from the iconographic point of view is that every one of the divinities sculptured has its name inscribed below in Nāgarī characters. We have thus here carved in stone, as it were, an illustrated hand-book of Hindu iconography of the fifteenth century. A reliable work on this subject is still one of the great wants of Indian Archæology. And if the figures on this Tower could be reproduced together with the accompanying inscriptions, we should certainly obtain a volume on Brahmanical iconography of undoubted authenticity. Accordingly, Dr. Vogel drew up a note pointing out the extreme desirability of preparing representations of these images. The position of the sculptures, however, rendered photographic reproduction seemingly impossible, as they are carved on the inner shaft of the Tower along the narrow passage measuring only 2′ 4″ in width and leaving no sufficient room for the camera. In 1904 Mr. Cousens, my predecessor, took photos of some images by means of a Kodak. "But the photographs thus obtained were unsatisfactory and unfit for reproduction." Dr. Vogel, therefore, suggested the more laborious and expensive process of drawing, and calculated that at least Rs. 2,500 would be required for preparing a complete set of drawings; and ended his note confidently hoping that His Highness the Mahārāṇā would take personal interest in the matter and would be ready to meet the cost of this work. The sum asked for was sanctioned in August last by the Mahārāṇā with the characteristic generosity and genuine sympathy for archæology which he had evinced some years ago by restoring at great cost the Jaina Tower on Chitorgaṛh or *Chhotā kirtham* as it is locally called, which was then in a parlous condition. It is scarcely necessary to add that he has thereby placed all students of Indian art and religion under great obligation. As Chitorgaṛh is in my Circle, the work of preparing reproductions of images and inscriptions has been entrusted to me by the Director-General of Archæology. When this work was formally assigned to me, the idea that was at once uppermost in my mind was to try and see for myself whether it was really impossible to photograph the sculptures. I was fully aware that the space in front of them was too narrow to allow any photographs to be taken of them in normal circumstances. Besides, I knew full well that it was not possible to command just the sort of light which alone could make photography successful. Though I was quite aware that there were these two serious drawbacks here, I was not convinced that with some ingenious manipulation it would not be possible to take satisfactory photographs. Accordingly when I was encamped for excavation purposes at Nagarī, 8 miles from Chitorgaṛh, I discussed certain devices with my Office Photographer, who, I am glad to say, is an expert in his craft, and sent him straight to Chitorgaṛh to try them. It was a matter of immense delight to me to find that those methods worked miraculously and to know that photographic reproduction would be eminently successful. Photos of

two or three images were taken and sent to the Director-General of Archæology for his approval. He too was exceedingly gratified to see that it was possible to *photograph the sculptures*, and at once fell in with my idea of preparing a set of photographs instead of drawings, as there can be no question that the former kind of reproduction was far more exact and reliable than the latter. I estimated that a sum of Rs 2,000 would be quite enough for the purpose and that there would thus be effected a saving of Rs. 500. The same work could have been carried out at a much smaller amount, if the prices of photo materials had not increased by fifty to ninety per cent. Messrs. D. Joglekar & Co., Poona, who generally take prints from my Office negatives for any scholar or antiquarian who is in need of them, have been entrusted for this sum with the work of preparing one complete set of negatives and two sets of prints of the figures carved in the Tower after being duly initiated into the dodges and supervised by my Office Photographer. The negatives ... shall soon be engaged on preparing a ... Hindu Olympus, which is indeed a T ...

VIII.—EXCAVATION.

17. **Nagari.** In the touring programme published in the last year's Progress Report, I have stated that I would undertake excavations at Nagarī, a *jāgīr* village of the Rao of Bedla and 7 miles north of Chitorgaṛh in the Udaipur State, Rajputānā Accordingly I was encamped at this place from the middle of November 1915 to the end of January 1916. Thanks to the Udaipur Mahārānā, I had full permission to dig wherever I wished, on condition of my submitting to the Darbār a fortnightly list of the important archæological objects that would be unearthed I experienced, however, ... coolies, though the local ... me. When I was at ... the neighbouring villages ... the cultivating class of ... ht it below their dignity to handle the spade. The local authorities could not also force them to work at our camp, because some of them were actually attending to their field work and others were employed by the Jāgīrdārs and Māfīdārs of the adjoining places to cut leaves of berry trees to serve as fodder to their cattle, grass being this year very scarce *on account of scanty rains They were already receiving* each 12 annas per day, and naturally refused to join us Everywhere, again, the rumour was afloat that we had started the excavations to induce the strong-bodied people to come, thus to enable us to select recruits for the war!

18. Though a sufficient number of coolies was not obtainable, we started and pursued the work as best as we could. I was glad that the excavations proved eminently successful. A brief account of the important results achieved is contained in Part II of the Report, a full and detailed description being reserved for the Director-General's *Archæological Annual*, where it will be accompanied by illustrations. The digging operations were conducted at two places—one on a *stūpa* mound in the *qillāh* or citadel of Nagarī and the other at Hāthī-bāḍā, half a mile east of the village. The *stūpa* was found to be constructed of moulded bricks and decorated with terra-cotta ... those of the best kind in Gandhāra on t ... 49-50, para. 3). This was also exceedingl ... Sānchi being situated in a hilly d ... place was expected (pp. 52-3 ... was that of a stone *torana* or ... h was constructed when the *stū* ... of the Maurya or Suṅga period (B C. 250 to A. D. 150) and of the mediæval times (i e., from the 8th century onwards) have been found, but none so far of the Gupta period (A. D. 300 to A. D. 600) The find of this *torana*, therefore, constitutes a highly interesting discovery in the history of ancient Indian architecture (pp 50-1, para. 5-6). The excavations were no less interesting at Hāthī-bāḍā, which is a stone enclosure of a lofty and stupendous type. This was shown to be of the Maurya age (*c.* 250 B. C.) and to have originally enclosed a shrine of Saṁkarshaṇa and Vāsudeva. This was, therefore, the earliest shrine dedicated to

x 151—2

Vaishnava worship, the next earliest being that exhumed by me two years ago near Khām Bābā at Besnagar, ancient Vidiśā, and not anterior to B. C. 200 (pp. 51-2, para. 7). Some coins of the Sibi people also were picked up during these excavations. The legend on these coins clearly shows that the ancient name of Nagarī was Madhyamikā, and it is now conclusively proved that it can be no other than the Madhyamikā mentioned by Pantañjali (*c.* 150 B. C.) as having been besieged in his time by a Yavana or Greek king who is supposed to be Menander (p. 52, para. 8).

19. Though the discoveries made in these excavations were as interesting as they could possibly be to an antiquarian, they were a source of sore disappointment to the ordinary people from the neighbouring villages. They used to flock to these sites almost every day and inquire of us about the whereabouts of the treasure which they heard we had unearthed. The rumour about our having lighted upon a treasure was prevalent over the whole of the Udaipur State, and the people were hearing on all sides that negotiations were going on to settle the respective claims of the British Sarkār, Mahārāṇā of Udaipur, and the Rāo of Bedlā in regard to this treasure ! Of course, negotiations were going on, but in respect of the archæological treasure dug out by us. And at my representation Pandit Sukhadeo Prasad, C.I.E., Minister of the Udaipur State, was kind enough to secure the permission of the Mahārāṇā for the transfer, to the Ajmer Museum, of all the objects of archæological interest exhumed at Nagarī. This was but expected of the Mahārāṇā, whose sympathetic and enlightened policy towards archæology is too well-known to require any mention. It was this most respected of the Rajpūt Chiefs who, as stated above, is liberally financing the work of preparing photographic representations of the deities of the Hindu pantheon sculptured in the Great Tower of Rāṇā Kumbha on the fort of Chitorgaṛh. As soon as I received permission of the Udaipur Darbār for the exhibition, in the Ajmer Museum, of the antiquities found at Nagarī, I put myself in correspondence with the Superintendent of that Museum who about the beginning of March last promised to remove them there as speedily as possible.

Ajmer.

20. Among the inscription stones exhibited in the Rājputānā Museum not the least important are six beautifully inscribed slabs, of which two are in fragments. Four of these, which are far better preserved than the others, have engraved on them parts of two Sanskrit plays, one of which is called *Lalita-Vigraharāja* and the other *Hara-keli-nāṭaka*. The latter, we are told, was composed by the Chohān sovereign Vigraharāja himself, and the former by a court poet in praise of this king's exploits. All these slabs were brought to light while some minor digging operations were going on in 1875-76 in the courtyard of Aṛhāī din-kā Jhuṁprā, the most celebrated mosque of Ajmer. The importance of these tablets for Sanskrit literature and for the ancient history of Rājputānā can scarcely be exaggerated, and it was thought possible that a little more spade work would lay bare more fragments. Accordingly at the meeting of the Working Committee of the Ajmer Museum held in April 1912 it was resolved to address the Director-General of Archæology with a view to further excavation being undertaken at the Jhuṁprā in search of the missing fragments and of other archæological remains. The Director-General of Archæology sympathised with the idea and agreed to place an allotment for the purpose on condition that the excavations would be carried out by me. This was approved by the Working Committee, and in July last a sum of Rs. 500 was kindly sanctioned by him. Accordingly after bringing my excavations at Nagarī to a close, I went to Ajmer and was encamped there for nearly three weeks and was busy with digging operations at Aṛhāī din-kā Jhuṁprā. I was not very hopeful of the results, for after 1875-76 the place had again been excavated in 1902-03 by Rāi Bahādūr Shām Nāth, who was then Executive Engineer of Ajmer-Merwāra, partly with a view to procuring old stones for repairing the mosque and partly in the hope of making new discoveries. Still I resolved to leave no efforts untried to the extent of the allotment. The courtyard was accordingly covered with a regular network of trenches. Trenches were also sunk in the south porch and immediately behind the prayer chamber. The main object with which the work was undertaken was not realized, for no fragments of the inscribed slabs, except a small one, were unearthed. In other respects, however, it was a very successful operation—successful even beyond my expectations. This is not the place for giving any

detailed account of it, and only a few remarks must, therefore, here suffice. Quite a wealth of sculptured pieces, such as images, pillar shafts, capitals, *āmalaka* fragments, was here brought to light. The best specimens from *these were selected for the Museum.* One sculpture, though it was a fragment, was very curious. It contained the figures of such rare deities as those which preside over the dawn, morning, noon, afternoon and evening. I *have not so far found them sculptured anywhere.* And as each deity has here been labelled with its name, it is impossible to over-rate the importance of this piece from the iconographic point of view. The excavations were interesting in another way also. Immediately below the wall of the prayer chamber were exposed on both sides wallings of an older edifice. No doubt can, therefore, be entertained as to a more ancient building having stood here. It is well known that Aṛhāī din-kā Jhuṁprā mosque has been built of materials from old Hindu temples, and from a small inscription in a staircase of the prayer-chamber I have shown in one of my former Reports that most of these materials, if not all, were taken from a temple originally erected by [illegible]
ened by the inscribed slabs referred to ab [illegible]
thus appears to have occupied this positio [illegible]
structure that the Muhammadans were able to build their mosque on the present site.

21. I was not able to expend the whole of the allotment on these excavations. Nearly one-fourth of the amount had to be reserved for the re-filling of the trenches and levelling of the ground. This work was entrusted to the local Public Works Department, who, I hope, have restored the monument to its original condition.

IX.—EPIGRAPHY.

22. This year also was prolific in the discovery of interesting and important inscriptions. A summary of their contents will be found in Part II Two of these, in particular, are of very great importance. One was discovered by me at [illegible] question about the origin of the well-
[illegible] para 15). The second epigraph
[illegible]

the late Prof. [illegible]
say, in our favour. It also [illegible]
to the Pratihāra dynastic list (pp. 57-9).

X.—NUMISMATICS.

23 I was able to make some exceedingly interesting discoveries this year in the field of numismatics also. Part II (pp 59-60) gives a brief description of them and points out in what the unique character of each coin consists One coin, in particular, deserves special notice here. It is that of Andragoras, who was appointed Satrap of Parthia by Alexander the Great No coin of this Greek Satrap is known yet to exist in any museum in India or England, and I am extremely glad I was able to secure it for the Prince of Wales Museum It was among the coins I bought from Mr Billimoria of Bhuj (*infra*, pp. 20-1)

24. In January 1914, 262 old coins were found in the village of Dhanpurī in the Jambughodā State of the Rewā Kānṭhā Agency by some labourers working on the Shivrājpur-Jambughodā road. As no private claim over the find was established, all the coins were taken possession of by that State Seven specimen coins were at first forwarded to me for inspection, but, at my request through the Political Agent, 234 more were sent by the Darbār at the end of April 1915. Of the 241 coins so received, 139 were found to belong to Mahmud I and 102 to Muzaffar II, both Sultāns of Gujarāt A statement specifying full details of these coins will be found in Appendix G. Six of them represent a hitherto unknown type and are thus interesting from the numismatic point of view (*infra*, p 60, paras. 24-6). At the desire of the Jambughodā Darbār, the coins were distributed to the recognized museums in accordance with Government Resolution No. 5515, dated the 24th September 1914, Political Department, as many being

sent to them as the Curators required. The remainder, viz., 41 coins, were returned through the Political Agent. The very fact that no less than 200 coins from the hoard were taken by the various museums (including the Prince of Wales Museum) shows how badly these specimens were needed, and the Jambughoḍā Darbār, therefore, deserve special thanks for having sanctioned the liberal distribution of the coins.

XI.—PROTECTED MONUMENTS.

25. The list of the monuments which have been brought under protection has been printed in Appendix H. It will be seen from it that during the year under review only 17 monuments were declared protected. This number no doubt looks very small as compared with 160 of the preceding year or even with 41 of the year previous to the latter. But it is to be remembered that this number must become smaller and smaller every year. Very few, indeed, from Mr. Cousens' list published in the Progress Report for 1907-08 (pp. 15-19) now remain unprotected, and, over and above those mentioned in it, as many as 241 have been declared protected.

26. What is now essential is the execution of agreements with the owners of those monuments which are not Government property. And in this respect it is exceedingly gratifying to find that this year no less than 53 agreements have been entered into as against 12 of the last, or even 41 of the last but one year. These have been specified in the same appendix. It must, however, be borne in mind that monuments, not owned by Government, in regard to which agreements have yet to be taken, are by no means few, and, in many instances, are in such a dilapidated condition as to require speedy and extensive repairs which the private owners very often cannot themselves carry out where the responsibility for the execution of repair consequently falls on Government. But these repairs, urgent though they are, cannot be undertaken unless the necessary agreeements have been entered into, for it is not at all desirable that Government should expend large sums of money on repair and maintenance if the owners have not already bound themselves by such agreement not to disfigure and damage the monuments or make any unsightly modern additions to them, as there is every likelihood of such things happening. A list of such monuments has been given in the same appendix for the information of the Heads of the districts wherein they are situated, and it is sincerely hoped that they will lose no time in executing the necessary agreements.

XII.—CONSERVATION.

(a) Bombay Presidency.

Works carried out.

27. In the Bombay Presidency a total expenditure of Rs. 35,769 was incurred upon the conservation of ancient monuments during the year 1915-16. Of this amount Rs. 23,447 were expended upon special (non-recurring) repairs, and the residue, Rs. 12,322, upon annual repairs and maintenance. Appendix K gives the details of this expenditure and also specifies the different items of repairs executed. A succinct and interesting account is, however, contained in Mr. Page's "Conservation Commentary" (Part III, Section II). The repairs to most of these monuments have been going on for the last few years; and of those to which all the repairs have been completed during the year under report, specific mention may here be made of the Lāḍ Khān, Durgā and Huchchimalligudi temples at Aihole in the Bijāpur district. It is a matter of great delight that these temples—which pertain to the 5th century A. D., are gems of the early Dravidian style, and are exceedingly important, partaking as they do of the architectural peculiarities of the caves—have now been put in a structurally sound condition.

Champanir.

28. I am glad that, as mentioned in my last year's Report, the work of conserving the archæological buildings at Chāmpānir in the Panch Mahāls district has been commenced in accordance with the systematic plan laid down in the notes of the Director-General of Archæology and Mr. Page. Our object is not to restore the monuments to their original structure, but to conserve them, i. e., to put them in a sound state of repair. As much as Rs. 8,667 was expended on special repairs

and Rs. 497 on current repairs. During the year under review, special repairs were executed to four monuments here, a brief description of which I have given in Part III, pp 61-2, paras 1-5. On the whole, they were satisfactorily carried out and reflect great credit on the Public Works Department Officers There is, however, one item of repair here executed, regarding which I have somewhat to express my disapproval. My criticism on this point is contained at the end of paragraph 1 on page 61.

Inspection of Protected Monuments.

29. A brief description of the monuments visited by Mr. Page in accordance with the scheme of inspecting for conservation purposes all the archæological buildings that have been declared protected will be found in his " Conservation Commentary," which forms Part III of this Report. The greater portion of his touring season was intended to be spent in Sind, but this was not found possible, as he was suddenly called away to Agra as stated above, to officiate for the Superintendent of the Northern Circle Copies of the Conservation Notes which he drew up for the adoption of the necessary remedial measures for the monuments inspected have been duly submitted to Government both in the General and the Public Works Departments

Fine under Ancient Monuments Preservation Act.

30 I regret I have to report the following case which occurred in the Ahmedābād District About the end of 1914, one Haji Samad Miyabhai, Mutvali, connected with Sidi Basir Minars and Tombs in Sārangpur at Ahmedābād, made a proposal through the Executive Engineer and the Collector of the district to erect a mosque in front of the minars. As the monument was Government property, and the mosque to be erected was of an altogether modern type and construction, it was impossible for me to comply with the request, and the Collector also, I was glad to find, had no hesitation in coming to this decision. The Mutvali was accordingly warned not to erect any structure on the site of the monument. This warning, however, proved to be of no avail, and he built there a corrugated iron shed, for congregational prayers, serving thus the purpose of a mosque The Collector, therefore, had no recourse left but to take steps to have the Mutvali prosecuted under section 16 of the Ancient Monuments Preservation Act (VII of 1904), and he was fined Rs 50 by the City Magistrate.

Works proposed

31. Appendix R sets forth the works proposed for the year 1916-17 I am obliged to Government in the Public Works Department for having sanctioned Rs. 30,000 this year also. This was the minimum sum required for conservation purposes in the Bombay Presidency. Only those monuments that are in a parlous condition are at present taken up for care and preservation, after executing annual current repairs to those that have already been conserved I am also indebted to the Director-General of Archæology for having made an allotment of Rs 5,000 out of imperial funds

Inspection Reports

32. Inspection reports have been received this year from the following Executive Engineers .—Ahmednagar, East Khāndesh, Nāsik, Poonā, Sholāpur, Thānā, West Khāndesh, Nasrat Canals and Eastern Nārā districts, those of the last two officers being forwarded through the Superintending Engineer, Indus Left Bank. Excerpts from some of them have been embodied in Appendix N No inspection reports have

which abound with archæological monuments and in which important conservation work is in progress, and this Department cannot, therefore, attach too much importance to their reports. If it is not possible for the Executive Engineers to visit all the monuments in their districts in one year, the inspection can be spread over a longer period But a systematic personal inspection of these buildings by the Public Works Department Officers is absolutely necessary in the interest of archæological conservation. As pointed out in paragraph 46 (pages 10-11) of my Report for the year ending 31st March 1913, the necessity of such an inspection has been acknowledged by the Government of India and impressed on the Executive Engineers for action by the Bombay Government.

Archæological Sub-overseers

33. In my last year's report (pages 11-12, paragraph 36) I have adverted to the appointment of four Archæological Sub-overseers for the more thorough and effective conservation of the

of the Entrance of the Jāmiʻ Masjid and the Alamgir Gate, both at Māndū. The big white marble lintel required for the former was specially quarried at Makrānā, and as it took slightly longer time than was expected to reach its destination, the work could not be carried out before the end of the financial year. No doubt can, however, be now entertained that it will be complete ere long. The drop wall of the Alamgir Gate had developed a new crack, about 3 to 4 inches wide, and had inclined forward on the road. The necessary portion was dismantled and rebuilt. The foundations of the main wall of the Gate had also been exposed at several places and were underpinned. A description of the items of repairs actually executed will be found in Appendix L.

Rewah and Bhopal States

39. Some petty repairs were executed at Chandreh and Amarka[illegible] Rewah State, as will b[illegible] through the Political A[illegible] in Appendix L. A description of the conservation work carried out at Sāñchi in the Bhopāl State under the direct supervision of the Director-General of Archæology will duly appear in his Report.

Surwaya, Gwalior.

40. About the beginning of August 1915 I visited Surwāyā, 12 miles from Siprī, in the Gwālior State, and inspected the archæological remains in the *gaḍhi* there in accordance with the wishes of the Mahārājā, who wanted to make it a site attractive to visitors and consequently required advice to this end. The remains consisted mainly of two temples, one monastery and one mosque. Of these, the mosque was of no particular architectural merit. But the temples were highly interesting even though they had lost their spires. They certainly could not be later than the 10th century A. D., and might be even a century older. The carvings were bold, deep and artistic, particularly so in the case of the porch ceiling of the larger temple. The big structure close by, which was constructed of huge blocks of stone well-dressed and laid without mortar, was doubtless a monastery, and as very few specimens of this style of building are known in India, it was of great archæological importance and conduced greatly to the antiquarian interest and value of the site. The Mahārājā of Gwālior's idea of over-hauling these structures and making the site worth visiting was, therefore, a very happy one, and the measures necessary for the realisation of this object were embodied in a note which I duly submitted to His Private Secretary. The repairs, I hear, were commenced soon after, and were in full swing about the close of March last. According to my recommendation, they were being carried out by an able Overseer under the supervision of Mr. M. B. Garde, Inspector of Archæology, Gwālior, both of whom had accompanied me to Surwāyā, and had thus an exact idea of the sort of repairs that were here required. I have no doubt that before long visitors will flock to this site and enjoy themselves most profitably, provided a guide-book is prepared as was also suggested by me.

(c) Rajputana.

Mount Abu.

41. In regard to the Dilwārā temples on Mount Ābū, the Executive Engineer, Mount Ābū Division, says: "The year was spent in preparing a capital and a lintel in the Chandan Chowk in Vastupal's temple which are ready and will be fixed this year. About 25 missing and broken flowers in the Chandan Chowk of Adinath's temple were replaced by new ones. The expenditure during the year was Rs. 2,500." It is sincerely hoped that the temple custodians are not pursuing their replacement policy, to which reference has been made in my last year's Report (page 14, paragraph 44).

Appendix M describes in brief the conservation work accomplished at other places in Rajputānā.

XIII.—TOUR PROGRAMME FOR 1916-17.

Superintendent's Tour.

42. As Mr. Page is no longer in this Circle and my present Assistant is not an architect, the care and conservation of ancient monuments will occupy me next year as much as the research and exploration work. Fortunately the work of systematically inspecting all the monuments declared "protected" and suggesting measures for putting them into structurally sound condition has been brought

almost to a completion, as will be seen from the numbers of the Conservation Notes printed by Mr. Page from time to time. What is now needed is the execution of repairs recommended in these notes and, above all, the training of the Archæological Sub-overseers who will henceforth be responsible for the quality of the repairs that will be carried out. This will necessitate my visiting all the centres of conservation work, such as Champanir, Ahmedabad, Dholka, Bijapur, Badami, Dambal and so forth. I shall also be required to visit such monuments as have not yet been inspected by Mr. Page but may stand in need of early repairs. As many of these as possible will also be visited. Outside the Bombay Presidency the only place I at present know I have to visit, is Mandu in the Dhar State. A new crack has developed itself in the walls of an old building called Rupmati Pavilion. The Dhar Darbar has asked for my advice for arresting the further gaping of this crack. In addition to these there may be, as in the past, unforeseen calls to other places in any part of my Circle.

43. In regard to the exploration work I intend executing, as far as practicable, in the Bombay Presidency. The only province in the Presidency that offers a good field for this work is Sind. It is, however, necessary to test with trial pits the various ruins with which this territory is studded before I can select any particular site for concentrating excavation work upon it. And the ruins which I intend tapping next cold season are those near Mirpur Khas, from where Mr. Cousens extricated a Buddhist Stūpa nearly six years ago. During my camp at Mirpur Khas I shall try and visit other ruins in Sind to make myself acquainted with them.

Assistant Superintendent's Tour.

44. The work of preparing an inventory of the ancient monuments of Rajputana which latterly I have not been able to take up owing to other multifarious duties of a more pressing nature, will now be resumed by my present Assistant, Dr. V. S. Sukthankar, who is acting for Mr. Page. He will commence his touring with visiting places of antiquarian interest in the Sirohi State, such as Uthman, Barman and so forth, and proceed to the south-easternmost parts of the Jodhpur State, from where he will proceed north, prosecuting his search for antiquarian remains in the Jaswantpura, Jalor, Jaitaran, Sojat and other districts. As the remains in these parts seem almost inexhaustible, he will have enough work to occupy him for one whole cold season.

D. R. BHANDARKAR, M.A.,

Superintendent, Archæological Survey of India,

Western Circle.

Poona, 1st August 1916.

APPENDICES.

APPENDIX A.

Superintendent's Diary.

Month	Date	Place
	1915.	
April	1st	Tāndo-Mahammad-khān to Karāchī.
	2nd	Halt at Karāchī.
	3rd	Karāchī to Mīrpūrkhas
	4th to 5th	Halt at Mīrpūrkhas.
	6th	Mīrpūrkhās to Jodhpūr
	7th to 9th	Halt at Jodhpūr
	10th	Jodhpūr to Ajmer.
	11th to 16th	Halt at Ajmer
	17th to 18th	Ajmer to Poonā.
	19th to 11th May	At headquarters
May	12th	Poona to Bombay.
	13th	Bombay to Sopārā and back
	14th	Halt at Bombay
	15th	Bombay to Elephanta.
	16th to 17th	Halt at Bombay.
	18th	Bombay to Kanheri
	19th to 20th	Halt at Kanheri
	21st	Kanheri to Bombay
	22nd	Halt at Bombay.
	23rd	Bombay to Poonā.
	24th to 7th Aug	At headquarters
Aug.	8th to 9th	Poonā to Gwalior
	10th	Gwalior to Sipri.
	11th	Halt at Sipri
	12th to 13th	Sipri to Surwayā and back
	14th	Halt at Sipri.
	15th to 16th	Sipri to Bombay.
	17th	Halt at Bombay.
	18th	Bombay to Poonā.
	19th to 23rd Sept	At headquarters
Sept.	24th	Poonā to Bijāpur.
	1915.	
Sept.	25th	Halt at Bijāpur.
	26th	Bijāpur to Poonā.
	27th to 21st Oct.	At headquarters.
Oct	22nd	Poonā to Bombay.
	23rd	Halt at Bombay.
	24th	Bombay to Poonā.
	25th to 11th Nov.	At headquarters.
Nov.	12th to 13th	Poonā to Chitorgarh.
	14th	Chitorgarh to Nagari.
	15th to 13th Dec	Halt at Nagari
	14th	Nagari to Ajmer.
	15th	Halt at Ajmer.
	16th	Ajmer to Nagari.
	17th to 31st	Halt at Nagari.
	1916	
Jan.	1st to 3rd	Nagari to Bijāpur.
	4th to 5th	Halt at Bijāpur.
	6th to 7th	Bijāpur to Poonā.
	8th to 9th	At headquarters.
	10th to 12th	Poonā to Nagari
	13th to 30th	Halt at Nagari.
	31st	Chitorgarh to Udaipur and back.
Feb	1st	Chitorgarh to Ajmer.
	2nd to 18th	Halt at Ajmer.
	19th to 20th	Ajmer to Poonā.
	21st to 23rd March	At headquarters.
March	24th	Poonā to Bombay
	25th	Halt at Bombay
	26th	Bombay to Poonā.
	27th to 31st	At headquarters

Assistant Superintendent's Diary.

Month	Date	Place
	1915.	
April	1st to 11th	At headquarters
	12th	Poona to Kanheri.
	13th to 14th	Halt at Kanheri.
	15th	Kanheri to Ghodbandar
	16th	Halt at Ghodbandar
	17th to 18th	Ghodbandar to Revdandā
May	12th to 31st	At headquarters.
June	1st to 8th	Poonā to Śrīnagar (Kāshmir State)
	9th to 14th Aug	Halt at Śrīnagar
Aug	15th	Śrinagar to Uri and back
	16th to 3rd Sept.	Halt at Śrinagar.
Sept	4th	Śrinagar to Achbal and back
	5th to 30th	Halt at Śrinagar.
Oct	1st to 6th	Śrinagar to Poonā.
	7th to 11th Nov	At headquarters
Nov	12th to 13th	Poona to Sāvkhed via Erandol
	14th	Sāvkhed to Chopdā and back
	15th	Halt at Sāvkhed.
	16th	Sāvkhed to Amalner.
	17th	Amalner to Surat.
	18th to 20th	Halt at Surat.
	21st	Surat to Hālol
	1915.	
Nov	22nd to 26th	Halt at Hālol.
	27th	Hālol to Desar and back.
	28th to 30th	Hālol to Hyderābād (Sind)
Dec	1st to 7th	Halt at Hyderābād.
	8th	Hyderābād to Tattā.
	9th to 11th	Halt at Tattā.
	12th	Tattā to Dādu.
	13th to 15th	Halt at Dādu
	16th	Dadu to Naundero
	17th	Naundero to Ratedero
	18th	Halt at Naundero
	19th	Naundero to Sukkar.
	20th to 23rd	Halt at Sukkar
	24th	Sukkar to Daur
	25th	Daur to Thūl-Mir-Rukhan.
	26th	Thūl-Mir-Rukhan to Kubo and back.
	27th	Halt at Thūl-Mir-Rukhan
	28th	Thūl-Mir-Rukhan to Daur
	29th	Daur to Khathar via Hyderābād
	30th	Khathar to Gaja and back.
	30th to 1st Jan	Khathar to Mhow via Hyderābād
	1916	
Jan	2nd	Halt at Mhow.
	3rd	Mhow to Barwāni.
	4th to 8th	Halt at Barwāni
	9th to 10th	Barwāni to Chitorgarh via Mhow
	11th to 16th	Halt at Chitorgarh
	17th to 18th	Chitorgarh to Poonā.
	18th to 24th	At headquarters
	25th	*Left Poona for Agra on transfer to the Northern Circle.*

APPENDIX B.

List of Drawings prepared during the year 1915-1916.

Serial No	Locality.	Title of Drawing	Paper or Linen	Scale	Remarks.
1381	Gyāraspur	Plan of the temple of Bajra-matha	Paper ...	...	Completed.
1382	Besnagar	Plan of excavation near Khām-bābā	"	1" = 16'	"
1383	"	Plan of excavation in Besnagar	"	1" = 8'	"
1384	Saidpur	Plan of excavated *stūpa*	"	3/16" = 1'	"
1385	"	Details of above *stūpa*	"	¼" = 1'	"

APPENDIX C.

List of Photographs taken by the Archæological Survey, Western Circle during the year 1915-16.

BOMBAY PRESIDENCY.

Serial Number.	Size.	Subject.	Locality.	District.
4434	Half ...	Gerauld Aungier's tomb, view from NE. .	Surat ...	Surat.
4435	Full ...	Panch-Mahudā-ki-masjid, interior view ...	Champānīr ...	Panch Mahāls.
4436	Half ...	Do. view of a *minar*.	Do. ...	Do.
4437	Full ...	Ek Minār-ki-masjid, view from SE. ...	Do. ...	Do.
4438	Do. ...	Boharā masjid, view from SE. ...	Do. ...	Do.
4439	Half ...	Do. back view from SW. ...	Do. ...	Do.
4440	Full ...	Jāmi' masjid, view from SE. ...	Do. ...	Do.
4441	Half ...	Do. general view from SE. ...	Do. ...	Do.
4442	Do. ...	Kevḍā masjid, view from SE. ...	Do. ...	Do.

SIND.

Serial Number.	Size.	Subject.	Locality.	District.
4443	Full ...	Hāji Mir Muhammad Khān's wife's tomb, view of a ceiling.	Hyderābād ...	Hyderābād.
4444	Do. ...	Amir Ghulām Shāh and Mir Fajul Ali tombs.	Do. ...	Do.
4445	Half ...	Tombs in compound No. 2	Do. ...	Do.
4446	Full ...	Ghulām Shāh Kalhorā's tomb, view from NE.	Do. ...	Do.
4447	Do. ...	Karīm Ali Khān and Haji Mir Muhammad Khān's tombs, view from SE.	Do. ...	Do.
4448	Half ...	Tombs in compound No. 1	Do. ...	Do.
4449	Full ..	Ghulām Nabi Kalhorā's tomb, view from SE.	Do. ...	Do.
4450	Half ...	Mirzā Jāni Beg's tomb, view from south .	Tattā ...	Karāchi.
4451	Full ...	Isā Khān's tomb, view from SE. ...	Do. ...	Do.
4452	Half ...	Do. view from SW. ...	Do. ...	Do.
4453	Do. ...	Navāb Shurfa Khān's tomb, view from SE.	Do. ...	Do.
4454	Do. ...	Do. interior view.	Do. ...	Do.
4455	Do. ...	Jāmi' masjid, view from SE. ...	Do. ...	Do.
4457	Do. ...	Jām Nizām-ud-dīn's tomb, view from SW.	Do. ...	Do.
4458	Do. ...	Mirzā Isā Khān's tomb	Do. ...	Do.
4459	Full ...	Jāmi' masjid, view from east ...	Khudābād ...	Lārkhānā.
4460	Half ...	Yār Muhammad's tomb, view from SE. ...	Do. ...	Do.
4461	Full ...	Mosam Shāh's mosque and *minār*, view from SW.	Sukkar ...	Sukkar.
4462	Do. ...	Mosam Shāh's mosque and *minār*, interior view of dome.	Do. ...	Do.
4463	Do. ...	Sat Bhain hill, view from SW. ...	Rohri ...	Do.
4464	Half ...	Mīr Nūr Muhammad Khān's tomb, view from east.	Kubo ...	Lārkhānā.
4465	Full ...	Buddhist *stūpa*	Thul-Mir-Rukhan.	Do.

RĀJPUTĀNĀ.

Serial Number.	Size.	Subject.	Locality.	District.
4466	Full ...	Aḍhāī-din-kā-jhuṁpṛā after excavation, general view of trench No. H in SW. corridor.	Ajmer ...	Ajmer.
4467	Do. ...	Do. after excavation, view of trench No. E from north.	Do. ...	Do.

APPENDIX C—*continued.*

Serial Number.	Size	Subject		Locality	District.
4468	Full ...	Arhāī-din-kā-jhumprā	after excavation, general view of drain in trench No. B from east.	Ajmer .	Ajmer.
4469	Do. ...	Do	after excavation, fragments of pillars and capitals	Do ..	Do
4470	Do. ...	Do.	after excavation pieces of various sculptures	Do ...	Do
4471	Do ..	Do	after excavation, fragment of sculpture representing *time* and *nakshatra*	Do ..	Do
4472	Half ..	Do	after excavation, part of basement and pillar	Do ...	Do
4473	Do ..	Do	after excavation, fragments of pillars	Do	Do.
4474	Do. ..	Do	after excavation, fragment of pillar	Do ..	Do.
4475	Do ...	Do	after excavation, fragments of miscellaneous pieces ..	Do	Do
4476	Do .	Do	after excavation, fragments of beams	Do .	Do
4477	Do ...	Do	after excavation, capitals and a top member of *śikhara*	Do ..	Do
4478	Do ...	Do	after excavation, capitals and a fragment of a basement	Do	Do.
4479	Do ..	Do	after excavation, pieces of *āma laka*	Do	Do
4480	Do ...	Do.	after excavation, sculptures at the bottom of a door jamb.	Do .	Do.
4481	Do ...	Do.	after excavation, standing image of Śiva	Do	Do
4482	Do ...	Do.	after excavation seated image of Śiva	Do. .	Do
4483	Full ...	Temple of Mahādeva	after excavation, general view from SW.	Nagari .	Chitorgarh (Udaipur State)
4484	Do. ...	Do	after excavation, view of base mouldings from NW	Do ...	Do
4485	Do. ...	Do	after excavation, general view of drain from west	Do ..	Do
4486	Do. ...	Do	after excavation, pillar of *torana*, front view.	Do. ...	Do

APPENDIX C—*continued.*

Serial Number.	Size.	Subject.	Locality.	District.
4487	Full ...	Temple of Mahādeva after excavation, pillar of a *toraṇa*, enlarged details of the top.	Nagarī ...	Chitorgarh (Udaipur State).
4488	Do. ...	Do. after excavation, pillar of a *toraṇa*, rear view.	Do. ...	Do.
4489	Half ...	Do. after excavation, pillar of a *toraṇa*, fourth side.	Do. ...	Do.
4490	Do. ...	Do. after excavation, another pillar of a *toraṇa* in fragments.	Do. ...	Do.
4491	Full ...	Do. after excavation, *toraṇa* lintel in two pieces, front view.	Do. ...	Do.
4492	Do. ...	Do. after excavation, *toraṇa* lintel in two pieces, rear view.	Do. ...	Do.
4493	Do. ...	Do. after excavation, *toraṇa* top lintel, front view.	Do. ...	Do.
4494	Half ...	Do. after excavation, *toraṇa* top lintel, rear view.	Do. ...	Do.
4495	Do. ...	Do. after excavation, brick carved with human heads.	Do. ...	Do.
4496	Full ...	Do. after excavation, bricks carved with birds.	Do. ...	Do.
4497	Do. ...	Do. after excavation, bricks of various types.	Do. ...	Do.
4498	Do. ...	Do. after excavation, minor antiquities	Do. ...	Do.
4499	Do. ...	Hāthī-bāḍā, general view from NW. ...	Do. ...	Do.
4500	Do. ...	Do. general view of excavation towards the SE.	Do. ...	Do.
4501	Half ...	Bull capital in village	Do. ...	Do
4502	Do. ...	*Āmalaka* in village	Do. ...	Do.
4503	Do. ...	Old *ghāṇī*	Do. ...	Do
4504	Full ...	Sādū Mātā's Ghusalni	Do. ...	Do.
4505	Half ...	Broken sculpture of Revanta ...	Do. ...	Do.
4506	Full ...	Kunyārḍī, pieces of railings at the top of the mound.	Do. ...	Do.

CENTRAL INDIA.

4507	Half ...	Image of Buddha	Barwāni ...	Barwāni State.

APPENDIX D.

Inscriptions copied during 1915-16.

Serial No.	Place	Position of Inscription
2723	Surat	Plates of Karṇarāja, Chaulukya king of Gujarāt.
2724	Do	Plates of Kīrtirāja Chaulukya king
2725	Do	Plates of Śilāra king Aparājita
2726	Jesar (Bhavnagar State)	Plates of Śilāditya III of Valabhī
2727	Nagari (Udaipur State)	On a loose stone found in the village
2728	Do do	Another loose stone found in the village
2729	Do	On a stone lying on the boundary of the village and Basti
2730	(Gwalior State)	In the well
2731	Udaipur	Stone brought from Nagari now in the Victoria Hall)
2732	Ajmer	On a stone in Rājputānā Museum
2733	Do	Another stone in Rājputānā Museum
2734	Do	Black stone in Rājputānā Museum
2735	Do	Fragment of an inscription discovered in excavations at Aḍhāī-din-kā jhompṛā
2736	Do	On outer side of southern wall near the south-east corner of Aḍhāī-din-kā jhompṛā

APPENDIX E.

Annual Expenditure of Survey.

	Rs. a. p.	Rs. a. p.
Salaries—		
Superintendent	7,062 14 5	
Assistant Superintendent ...	4,480 10 4	
Establishment	5,307 4 8	
Total ...		16,850 13 5
Travelling Allowances—		
Superintendent	2,133 4 0	
Assistant Superintendent	3,716 7 0	
Establishment	3,046 2 3	
Total ...		8,895 13 3
Supplies and Services—		
Excavations	2,405 15 0	
Photography and Photo material ...	861 15 0	
Purchase of, and repairs, to tents ...	648 14 9	
Purchase of instruments ...	173 0 7	
Total ...		4,089 13 4
Contingencies—		
Stationery ...	34 1 0	
Books ...	371 6 0	
Liveries ...	46 0 0	
Rents, Rates and Taxes ...	111 12 0	
Postage and Telegram Charges ...	265 3 0	
Conveyance of kit, etc ...	1,520 5 6	
Purchase of, and repairs to, furniture ...	102 15 6	
Pay of Menials ...	11 8 0	
Miscellaneous	272 14 0	
Total ...		2,736 1 0
Grand Total ...		32,572 9 0

Obv. جرح می آرد
سعر
طل ار حورشند و ماه
بر جهر حلش سکتر تیمور شاه

Rev. Within double circle, with dots between—
مانوس هرات
میمنت
حلوس
صرب

(12) Muhammad Shāh; Emperor (of Delhi); Mint Shāhjahānābād (Delhi); date A. H. 114x – 11 (= 1728-9 A. D)

Obv: محمود شاه بادشاه غازی
صاحب قران ثانی
سکه مبارک

Rev. دارلعلا شاه ن اباد
قمر مانوس
جلوس میمنت
11

(13) Muhammad Shāh, Emperor (of Delhi); Mint Shāhjahānābād (Delhi), date (A. H) 11xx – 18 (= 1735-36 A. D.).
Obv: & Rev: Similar.

(14) Muhammad Akbar II (of Delhi), Mint Jaipur, date 21 (Regnal).
Obv: Do. as above but محمد اکبر instead of محمد
Rev To r. branch of tree (Jaipur mint mark)—
مانوس
میمنت
۲۱
سنه جلوس

(The last three coins are on loan from the Director-General of Archæology in India)—

(*b*) List of Coins selected from the Sarvania Hoard

No.	Name of king	Father's name.	K or M K.	Date.	Remarks
1	Rudrasimha I ...	Rudradāman I ...	M.K.	105	An intermediate date, though *new*
2	Rudrasena I	Rudrasimha I ..	"	142	Re-struck.
3	Saṃghadāman	Do ...	"	14x	The only one coin of this king in this hoard (not read by Pandit Gauri Shankar Ojha).
4	Dāmasena	Do. ...	"	150	All coins of this date were formerly doubtful.
5	Dāmajadaśrī II	Rudrasena II ...	K.	155	One of the only two coins of this K. in this hoard.
6	Viradāman	Dāmasena ..	"	158	Intermediate dates, though *new* Prof. Rapson doubted whether there were any coins of these dates.
7	Do.	Do. ...	"	159	

No.	Name of king.	Father's name.	K. or M. K.	Date.	Remarks.
8	Yaśodāman I ...	Dāmasena ...	M.K.	160	*A new date.*
9	Vijayasena ...	Do. ...	K.	160	In good preservation.
10	Do. ...	Do. ...	M.K.	161	*A new date.* Coin in good preservation.
11	Do. ...	Do. ...	"	168	The form of "8" is peculiar.
12	Dāmajadaśrī III ...	Do. ...	"	177	*A new date.*
13	Rudrasena II ...	Vīradāman ...	"	178	Intermediate dates, though *new.*
14	Do. ...	Do. ...	"	179	
15	Do. ...	Do. ...	"	185	These coins extend the latter end of the king's reign.
16	Do. ...	Do. ...	"	197	
17	Do. ...	Do. ...	"	198 or 9	
18	Do. ...	Do. ...	"	No date.	A *svastika* punched on l. field on the obverse.
19	Viśvasiṁha ...	Rudrasena II ...	K.	197	*New dates.*
20	Do. ...	Do. ...	"	198	
21	Do. ...	Do. ...	M.K.	200	
22	Bhartṛidāman ...	Do. ...	K.	200	
23-29	Do. ...	Do. ...	M.K.	204-210	
30	Do. ...	Do. ...	"	216	An intermediate date, though *new* and important.
31	Viśvasena ...	Bhartṛidāman ...	K.	20[6]	If this coin is correctly read, it takes back the commencement of the reign of this king by nine years.
32	Do. ...	Do. ...	"	215	Two specimens selected, for the sake of the forms "5". *New date.*
33	Do. ...	Do. ...	"		
34	Do. ...	Do. ...	"	220	An intermediate date, though *new.*
35	Do. ..	Do. ...	"	222	Two crosses punched on obv. in circular incuse.
36	Do. ...	Do. ...	"	2[2]7	If this coin is correctly read like this, it would be the only instance of two Kshatrapas reigning together.
37	Rudrasiṁha II ...	Jīvadāman ...	"	226	*New date.*
38	Do. ...	Do. ...	"	227	These coins are rather rare.
39	Do. ...	Do. ..	"	228	
40	Do. ...	Do. ...	"	22x	Has got "=" after the legend.
41-45	Do. ...	Do. ...	"	234-238	The last dates for thi king were never clearly read.
46	Yaśodāman II ...	Rudrasiṁha II ...	"	238	*A new initial date.*
47	Do. ...	Do. ...	"	240	The forms of the numerals are uncommon.
48	Do. ...	Do. ...	"	247	A *new* and important intermediate date.
49	Rudrasena III ...	Rudradāman II ...	"	273	As a specimen only. The latest readable date n this hoard.
50	Īśvaradatta ...	......	M.K.	...	Dated "in the first year" of his reign.

Bombay Asiatic Society.

The Honorary Secretary of the Bombay Branch, Royal Asiatic Society, Bombay, has favoured me with a copy of the Annual Report of the Society for 1915, in which it is stated that "the number of coins added to the Coin Cabinet during the year was 113. Of these, 4 were gold, 61 silver and 48 copper and bullion. Of the total, 3 were presented by the Nagod Darbār; 75 by the United Provinces Government; 4 by the Director

of Agriculture and Industries, Central Provinces; 8 by the Assam Government; 4 by Mr. Abdul Fattah, Karachi; 1 by the Kashmir Darbar; 4 by the Madras Government; 10 by the Punjab Government; 2 by the Bengal Government and 2 by the Bombay Government. The specifications of the coins are not given here except in the case of the following, as there is none among them which is not in the list published under Poona Museum:—

Coins of Timur Dynasty (Silver).

1 Abdullā	...	...	... Mint Heerat.	dated 852.
1 Ulūgh Beg	...	...	.. "	" 828.
1 Shāh Rukh	...	..	.. "	
1 Defaced	...	...	.. "	

Victoria and Albert Museum, Bombay.

Specimens of Gandhāra sculptures were re-identified by the aid of a list sent to the Museum some years back by Dr. J. Burgess which was found among the old records. Certain discrepancies in the labels attached to the exhibits were noticed, and have been duly corrected.

A small stone pot containing a few specimens of copper coins struck by the Portuguese, was found when excavations were being carried out near Chaupaty. It was sent to the Museum by the Commissioner and has been added to the collection.

A stone tablet containing an inscription in English, formerly affixed to the wall of the Cawasji Patel Tank in Bombay, was removed to the Museum on the tank being filled in by the Municipality. Twenty-seven photographic views of Bombay taken mostly between the years 1880 and 1887 were purchased. These contain records of a considerable topographic interest.

The following 15 photographs of old buildings and places of interest in the city were taken by the 2nd Museum Assistant The Nakoda tank, old Head-quarters of the Bombay Volunteer Rifles, Pydowni, Old Municipal Office, Roman Catholic Cathedral at Bhuleshwar, Mapla House, Temple of Bhuleshwar, Jumma Masjid, Mahim Durga, Hindu Burning Grounds at Walkeshwar and Queen's Road, Muhammadan and Christian Burial Grounds at Queen's Road, the Old Secretariat and the Mazagaon Castle

A photographic enlargement of an engraved portrait of Queen Catharine of Braganza, wife of King Charles II of England, was made by the 2nd Museum Assistant and photographs of paintings of several of the former Governors of Bombay have been secured.

A catalogue, containing a brief history of the different exhibits in the room, has been partially prepared.

Poo

The following is the list of acquisitions made by the Archæological Museum, Poona, during the year 1915-16, consisting of 188 coins detailed as under —

124 coins presented by the United Provinces Government

1 Copper coin of 'Alā-ud-dīn Muhammad II, Sultan of Delhi, Mint Delhi.

4 Copper coins of Firoz III, Sultan of Delhi Mint Delhi, dated 762, 767, 770 and 778

1 Billon coin of Bahlol Lodi, Sultan of Delhi dated 893

24 Billon coins of Sikandar Lodi, Sultan of Delhi, of which 1 is of 895, 3 of 896, 2 of 898, 1 each of 899, 900 and 901, 2 each of 902, 903, and 1 each of 904, 905, 906, 907, 908, 909, 910, 911, 912, 913 and 920.

1 Silver and 2 copper coins of Akbar, Emperor, Mint Ahmedābād, dated 995, 993 and 997 respectively

8 Silver coins of Muhammad Shāh, Emperor, Mint Shāhjahānābād, dated 1136-6, 115x-21, 115x-22, 115x-23, 115x-24, 1155-25, 115x-26, 115x-27.

3 Silver coins of Ahmad Shāh, Emperor, Mint Shāhjahānābād, dated 1162-2, 1165-5, 1166-6

1 Silver coin of 'Ālamgir II, Emperor, Mint Shāhjahānābād, dated 1167-ahd.

6 Silver coins of Shāh 'Alam II, Emperor; Mint Benares, dated 1203, 1208, 1209, 1212, 1229, 1234, all with the regnal date 26 (!).

1 Silver and 1 copper coin of Ghāzī-ud-dīn Haidar, Nawāb of Oudh, in the name of Shāh 'Ālam II, dated 1234-26.

9 Silver coins of Ghāzī-ud-dīn Haidar, Mint Lucknow, of which 1 each is of 1234, 1236, 1237, 1238, 3 of 1239, and 1 each of 1241, 1242.

5 Copper coins of Ghāzī-ud-dīn Haidar, Mint Lucknow, dated 1234, 1235, 1236, 1237 and 1238.

3 Silver coins of Nāsir-ud-dīn, Nawāb of Oudh; Mint Lucknow, dated 1243, 1244 and 1248.

9 Copper coins of Nāsir-ud-dīn; Mint Lucknow, of which 1 each is 1243, 1244, 1245, 2 of 1246, and 1 each of 1247, 1248, 1249 and 1250.

14 Silver coins of Muhammad 'Alī Shāh, Nawāb of Oudh; Mint Lucknow, of which 1 each is of 1251, 1252, 2 of 1253, 3 each of 1254 and 1255, and 2 each of 1256 and 1257.

11 Silver coins of Amjad 'Alī Shāh, Nawāb of Oudh; Mint Lucknow, of which 2 each are of 1258, 1259, 1260, 1261 and 1262, and 1 of 1263.

18 Silver coins of Wājid 'Alī Shāh, Nawāb of Oudh; Mint Lucknow, of which 1 is of 1263, 2 each of 1264, 1265, 1266, 1267, 1 of 1268, and 2 each of 1269, 1270, 1271 and 1272.

2 Silver Mahomedan coins.

15 Coins presented by the Nāgod Darbār.

5 Copper coins of Bhojadeva I of Kanauja (Ādivaraha).

5 Copper coins of Muhammad bin Sām, Sultan of Delhi.

5 Copper coins of Shams-ud-dīn Altamash, Sultan of Delhi.

11 Coins presented by the Punjab Government.

11 Copper coins of Rudradāsa, Śivadāsa, etc., of the Audumbara tribe.

18 Coins presented by the Assam Government.

1 Silver coin of Ghiyās Shāh, Sultan of Bengal; Mint Lakhanavti.

7 Silver coins of Fakhr-ud-dīn Mubārak of Bengal; Mint Sunārgaon, dated 743 744, 745, 746, 747, 748 and 749.

6 Silver coins of Shams-ud-dīn 'Iliyās Shāh of Bengal; Mint Fīrozābād, dated 74x, 750, 751, 754, 755, and 1 without date.

3 Silver coins of Shams-ud-dīn 'Iliyās; Mint Sunārgaon, dated 754, 755 and 756.

1 Silver coin of Shams-ud-dīn 'Iliyās, without mint or date.

9 Coins presented by the Madras Government.

2 Gold coins probably of the Gaṅga dynasty of Kaliṅganagara.

2 Gold Gaṅga *fanams.*

5 Silver French Rupees of Shāh 'Ālam II; Mint Arcot, dated in the 13, 24, 25, 27 and 30th regnal years.

5 Coins presented by the Central Provinces Government.

2 Gold coins known as Padmaṭaṅkas.

3 Silver coins of Shāh 'Ālam II, Emperor; Mint Ravishnagar (Sāgar).

3 Coins presented by the Rewah Darbār.

3 Base gold coins of Madanavarman of the Chandella dynasty.

2 Coins presented by the Baroda Darbār.

2 Silver Bharuchi coins.

1 Coin presented by the Bombay Government.

1 Silver coin of Aurangzeb, Emperor of Delhi.

The following are the additions made to the Bijāpur Museum —

Name of articles.	No of articles	Remarks
China jars ...	2	Purchased from Jāgīrdār of Dargā near Bijāpur
Guns barrel ..	2	Do do
Armours ...	2	Do do
Elephant goad	1	Do. do
Mace	1	Do do
Sword	1	Do do
Arrow ..	1	Do do
China parrot	1	Do do
China figure	1	Do do.
History of Bijāpur in Hindustānī by Bashir-ud-dīn Ahmed, Tālukdār of Raichur.	1	Presented by J. K N Kabraji, Esquire
Old pictures	5	Presented by the Superintendent, Archæological Survey of Western Circle, with the permission of the Director-General of Archæology in India
Stone chain	1	Presented by Narsu Melgiri, Maistry, Public Works Department
Lime plastered earthen pot ...	1	Do do
Copper ball	1	Purchased from Yaktyar Sahib Bangi
Earthen jar	1	Do Vajoddin Sahib valad Shaik Sahib Bangi.
Silver tray (weight about 50 tolas) ...	1	Do. Mangalvedhekar of Bāgalkot
Silver part of buckle from Guledgudd (gross weight 18 tolas)	1	Presented by F. J Varley, Esquire, District Judge
Pictures, one of Chand Bibi and one of Rambhāvatī. .	2	
Copper coins	24	

Rajkot.

The Curator of the Watson Museum of Antiquities, Rājkot, reports that the following antiquities were added to the Archæological section of the Museum during 1915-16 —

Sculptures.

1 broken idol of Vishnu (Śeshaśāyin).

Manuscripts.

1 Laghu-Samgrahanī, pages 1 to 33

2 Śrāddha-dina-kṛitya by Jain Āchārya Devendra Sūri, pages 1 to 7 complete.

Coins.

3 Copper coins of Soter Megas.

3 Copper coins of Kshaharāta Bhūmaka

1 Copper coin of Jayadāman son of Chashtana

1 Silver coin of Rudrasimha II, son of Svāmi Jayadāman.

1 Silver coin of Yaśodāman son, of Rudrasimha, dated 242

4 Silver coins of Rudrasena III, son of Svāmi Rudradāman, dated 292, 29x, 284 (?) and 299

1 Copper coin of Skandagupta

1 Gold coin of the Roman Emperor Antonius Augustus Pius

2 Silver Gadhiya coins (1 ordinary and 1 flat).

2 Copper Kārshāpanas

1 Copper coin of Malayavarmadeva.

9 Copper coins of the Delhi Sultans (1 each of Muhammad-bin-Sām, Tāj-ud-dīn Yalduz and Altamash, 3 of Allā-ud-dīn Muhammad II, one dated 724 of Ghiās-ud-dīn Taghlaq, and 2 of Fīroz III.

1 Gold Mohar of Aurangzeb, Mint Shāhjahānābād, dated 1080-12.

3 Silver coins of Aurangzeb, Mint Itāwāh, dated 1114-46. 1116-48 and 1117-49

1 Gold Mohar of Muhammad Shāh; Mint Shāhjahānābād, dated 1135-5.

4 Silver coins of Muhammad Shāh; Mint Delhi, dated 1155-26, 1156-26 and 1158-28 A. H.; and one without date.

4 Silver coins of Shāh 'Alum II; Mint Benares, dated 1213, 1214, 1215, 1216, with regnal year 17 (!).

11 Silver and 24 copper modern coins of the following Native States:—Bhopal, Bundi, Chhota Udaipur, Dhar, Indore, Jaipur, Jaora, Jhalawar, Kotah, Nepal, Tonk, Topshahi. Ujjain.

Baroda Museum.

In his letter the Curator of the Baroda Museum reported that the coins of the following Muhammadan rulers were added during the year to the coin cabinet of that Museum:—

Akbar: Qutub-ud-dīn Mubārak Shāh I; Alā-ud-dīn Muhammad Shāh II; Ghiyās-ud-dīn Tughlaq I; Fīroz Shāh Tughlaq; Sikandar Shāh II Lodi; Sher Shāh; Islām Shāh; Muhammad Adil Shāh; Ahmad I; Muhammad II; Mahmūd I; Muzaffar II; Bahādur Shāh; Ahmad III; Muzaffar III; Mahmūd III.

Ajmer.

The Superintendent of the Rājputānā Museum, Ajmer, favoured me with the following report upon the new acquisitions for his Museum during the year 1915-16:—

Inscribed stones and copper-plate grants.

I.—Partābgarh inscription of the time of Pratīhāra king Mahendrapāla II of Mahodaya, dated Sam. 1003 (A. D. 946).

II.—Nagarī inscription (discovered by Mr. D. R. Bhandarkar, M.A.), dated Sam. 481 (A. D. 424).

III.—A copper-plate grant of Mahārājakula Vīrasimhadeva of Vāgaḍ, dated Sam. 1343 (A. D. 1287)—2 plates.

IV.—A small piece of the first (missing) slab of Harakelī Nāṭaka (found at Arhāī Din-kā-Jhumprā, Ajmer).

Images and Sculptures.

I.—An image of the boar incarnation of Vishṇu (found at Arthūṇā in the Bānswārā State).

II.—A standing image of Kālī (made of copper) with four arms (found at Pushkar).

III.—A copper image of Kālī (with four arms) dancing on the body of a demon (found at Pushkar).

IV.—A sculpture representing a female (sleeping) with a child by her side. Probably it represents Devakī and Krishṇa (found at Arthūṇa).

V.—A part of a sculpture representing figures of Kālī, Prabhāta, Prātar, Madhyāhna, Aparāhṇa and Saṁdhyā; as well as those of Magha, Pūrvaphālguna, Uttaraphālguna, Hasta Chitra, Svāti and Viśākha asterisms (found at Arhāī Din-kā-Jhumprā, Ajmer).

Coins.

4 Gold coins—all Fanums (of the Gaṅga dynasty).

86 Silver coins—belonging to the undermentioned dynasties:—

Chandella (Madanavarmadeva)
Sāmantadeva.
Mughal Emperors of Delhi.
Sultans of Gujarāt, and
Nawābs of Oudh.

62 Copper coins—belonging to the undermentioned dynasties:—

Audumbara (Rudrasena).
Pratīhāra (Ādivarāha).
Paṭhān Sultans of Delhi.
Mughal Emperors of Delhi.
Nawābs of Oudh.

Facsimiles of Inscriptions.

I.—An inscription of the time of the Guhila prince Vijayasiṁha of Mewār, dated Sam. 1173 (A.D. 1116), found at Pāldī near Bedlā, in the Udaipur State.

II.—An inscription of the time of Mahārāja Sūrapāladeva, found at Ṭhākardā in the Dungarpur State. It is dated the 1st day of the bright half of Bhādrapada, Sam. 1212 (A. D. 1115), and mentions the following princes:—

Prithvīpāladeva, *alias* Bhartripaṭṭa,
his son Mahārāja Tribhuvanapāladeva,
his son Mahārāja Vijayapāla, and
his son Mahārāja Sūrapāladeva.

Then it states that during the reign of the last mentioned prince, Mahārājaputra Anaṁgapāladeva granted land tilled by one plough (in a day) to (the temple of) the god Siddheśvara

III—An inscription of the time of Rāwal Pratāpasiṁha of Dungarpur State It is dated Sam 1461 (A D 1404) and records the construction of a Jain temple by Prahlāda, the minister of Rāwal Pratāpasimha.

IV—An inscription of the time of Rāwal Somadāsa of Dungarpur, found at Biha, in the Dungarpur State It is dated Sam 1505 (A D 1448) and records the construction of a well by Surtānadevī, a queen of Rāwal Somadāsa

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APPENDIX G

Treasure Trove.

Regarding the old coins acquired by the Government of Bombay under Treasure Trove Act, VI of 1878, and forwarded for examination and distribution to the Bombay Branch of the Royal Asiatic Society, the Honorary Secretary of that Institution has favoured me with a printed copy of the Society's Annual Report for 1915, from which the following information is taken —"There were 794 coins under examination at the close of the last year, besides 5 from the Collector of Kairā received in 1913; and 1,467 were received during the year under report. The latter included 40 copper from the Māmlatdār of Chālisgaon, 126 silver from the Māmlatdār of Bādāmi, 25 silver from the Māmlatdār of Shirūr, 659 silver from the Collector of Kairā, 51 silver from the Māmlatdār of Kalyān, 177 gold from the Collector [illegible] of West Khāndesh, 6 gold from the [illegible] bay Government, 30 silver from t[illegible] 93 silver from the Māmlatdār, Karma[illegible] of Chālisgaon, 126 silver from the [illegible] Māmlatdār of Kalyān, 246 copper fr[illegible] from the Māmlatdār of Karmalā were returned, being of no numismatic importance Eight hundred and twenty-three were examined and reported to Government and disposed of The coins were examined for the Society by Mr Framji J. Thanawala and Prof S R. Bhandarkar Six hundred and fifty-nine from the Collector of Kairā, 177 from the Collector of East Khāndesh, 15 from the Collector of West Khāndesh, 65 from the Collector of Sātārā and 30 from the Divisional Magistrate, Ahmedābād, have yet to be disposed of.

Of the 590 coins from Akolā reported to Government, the Māmlatdār returned 516 for disposal. These with the other 233 were disposed of in the following way.—

	Silver
Prince of Wales Museum	42
Indian Museum, Calcutta	17
Government Museum, Madras...	6
Provincial Museum, Lucknow	5
Lahore Museum	4
Nagpur Museum	4
Public Library, Shillong	4
Archæological Survey, Poona	3
Peshawar Museum	3
Quetta Museum	3
Ajmer Museum	3
Rangoon Museum	3
Dacca Museum	2
Asiatic Society, Bengal	2
Bombay Branch Royal Asiatic Society	2
British Museum, London	2
Fitz-William Museum, Cambridge	2
To Mint for sale and disposal	642
	749

The Collector of Ahmednagar informs me that "a treasure consisting of 85 silver coins called Chāndvāḍi Rupees was found on the 19th of July 1915 hidden in the wall of the house of one Dhondi valad Gyanu Gilbile at Palsi, tāluka Pārner. The coins are valued at Rs. 51-14-0 approximately."

Ahmednagar.

The Resident of Baroda informs me that "a treasure consisting of 1,152 Bharuchi coins was found at Ghelā, tāluka Kāmrej in the Naosāri Division of the Baroda State."

Baroda.

Mr. C. W. M. Hudson, I. C. S., Political Agent, Rewā Kāṇṭhā, informs me that old coins, 262 in number, were said to have been found in the village of Dhanpurī in the Jambughoḍā State of his Agency on 19th January 1914 by some labourers working on the Shivrājpur-Jambughoḍā road. As no claim over the find has been established all the coins have been confiscated to the State. Seven specimen coins were forwarded to me for examination. He also stated in it that on receipt of my report thereon he would send me the other coins for distribution among the recognized institutions and Darbārs, if necessary.

Jambughoda.

On receipt of my report on those 7 coins forwarded to him, he forwarded to me 234 coins for distribution.

Below is given the statement of the distribution of the coins, the surplus balance of 41 coins having been returned to the Political Agent, Rewā Kāṇṭhā.

Name of Museum.	Coins.		Total No.
	Mahmūd.	Muzaffar.	
Indian Museum	25	2	27
Madras Museum	16	6	22
Provincial Museum, Lucknow	7	9	16
Victoria Museum, Lahore	3	5	8
Nāgpur Museum	5	12	17
Shillong Museum	8	5	13
Peshāwar Museum	2	7	9
Quetta Museum	7	6	13
Ajmer Museum	6	4	10
Rangoon Museum	6	4	10
Dacca Museum	4	4	8
Royal Asiatic Society, Bengal	...	3	3
Bombay Branch Royal Asiatic Society, Bombay ...	...	4	4
Prince of Wales Museum, Bombay	23	17	40
Total ...	112	88	200
Balance ...	17	24	41

APPENDIX H.

(a) Protected Monuments.

1. The undermentioned monuments in the **Dharwar District** have been declared protected by Government Resolution No. 4815, General Department, dated the 16th June 1915:—

1	Hubli ...	Adargunchi ..	Large Jain Image	III
1a	Do. ...	Do. ...	Inscription	I (b)
2	Gadag ...	Betgeri ...	Vīrakkal on land of the Hatagara Mallāraya; also inscribed memorial stones in a walled enclosure in the village. (The collection of stones 15 in number and enclosed by a mud wall locally known as Mallārayaṅkaṭṭi.)	I (b)

2. The undermentioned monument in the **Ahmedabad District** has been declared protected by Governmnent Resolution No. 6416, General Department, dated the 17th August 1915:—

1	Dholkā ..	Dholkā ...	Khān Tank with its sluice ...	II (*a*)

3. The undermentioned monument in the **Nasik District** has been declared protected by Government Resolution No 7409, General Department, dated the 25th September 1915:—

1	Yeolā ..	Deothān ...	Hindu temple	I (*b*)

4. The undermentioned monument in the **Panch Mahals District** has been declared protected by Government Resolution No. 7412, General Department, dated the 25th September 1915 —

1	Godhrā ...	Kankanpur	The temple of Mahādeva ..	II (*a*)

5. The undermentioned monuments in the **Ahmedabad District** have been declared protected by Government Resolution No. 7669, General Department, dated the 4th October 1915:—

1	North Daskroī.	Dariāpur-Kāzīpur.	Miyan Khān Chisti's Masjid	II (*b*)
2	Do. ..	Rājpur-Hirpur.	Ibrāhīm Sayyid's Masjid ...	II (*b*)
3	South Daskroī.	Isanpur ...	Jethābhāi's step-well	II (*b*)
4	Dholkā ...	Dholkā ...	Mālav Tank	II (*b*)
5	Do. ..	Do .	The ruined building near the Tankā Masjid	II (*b*)

6. The undermentioned monument in the **Thana District** has been declared protected by Government Order No. 1430, General Department, dated the 25th February 1916 —

1	Salsette ...	Bandrā ...	Fort	II (*b*)

7. The undermentioned monument in the **Panch Mahals District** has been declared protected by Government Order No. 1637, General Department, dated the 6th March 1916 —

1	Hālol ..	Chāmpānir...	Two brick *mīnārs* situated in the jungle about half a mile south of Kevdā masjid	II (*a*)

8. The undermentioned monuments in the **Poona District** have been declared protected by Government Order No. 1639, General Department, dated the 6th March 1916:—

1	Haveli ...	Simhagad ...	The tomb of Rājārām Mahārāj ...	II (*b*)
2	Do ...	Do. ..	The tomb of Tānāji Mālusare .	II (*a*)
3	Do ..	Fulgaon ...	The Peshvā's bathing *ghāṭ* ...	III

9. The undermentioned monument in the **Bijapur District** has been declared protected by Government Order No. 2622, General Department, dated the 12th April 1916 —

1	Bijāpur ...	Bijāpur ...	Hyder (Uph) Burj	II (*a*)

(b) Agreements.

In his letter No. P.W.D.-41, dated the 17th March 1915, the Collector of **Belgaum** reports having executed agreements in the case of the monuments listed below and his action has been approved of by Government as per Government Resolution No. 3391, General Department, dated the 24th April 1915:—

(1) Kadamba inscription dated *Śaka* 1082 in the temple of Kalameśvara at Golihaḷḷi in the Khānāpur tāluka.

(2) Kadamba inscription dated *Kaliyuga* 4270 and 4283 in the temple of Basava at Golihaḷḷi in the Khānāpur tāluka.

(3) Two Kadamba inscriptions dated *Kaliyuga* 4270 and 4272 in the temple of Varāha-Narasiṁha at Halsi in the Khānāpur tāluka.

The Collector of **Dharwar** in his letter No. 2624, dated the 24th April 1915 reported his having executed agreements in the case of the monuments mentioned below and his action has been approved of by Government as per Government Resolution No. 8198, General Department, dated the 22nd October 1915:—

(1) The temple of Chandramauliśvara at Unkal, tāluka Hubli.

(2) The temples of Banaśaṁkarī Devī and Śankaraliṅga at Amargol, tāluka Hubli.

(3) The temple of Basavana at Tambur, tāluka Kalghatgi.

(4) The temple of Someśvara at Haralhaḷḷi, tāluka Karajgi.

(5) The temple of Galgeśvara at Galagnāth, tāluka Karajgi.

(6) The temple of Siddheśvara at Haveri, tāluka Hangal.

(7) The temple of Tārakeśvara at Hangal, tāluka Hangal.

(8) The temple of Kalameśvara and Rāmeśvara at Balambid, tāluka Hangal.

(9) The temple of Sarveśvara at Naregal, tāluka Hangal.

(10) The temple of Kadambeśvara at Rattihaḷḷi, tāluka Kod.

(11) The temples of Sarasvatī and Someśvara at Gadag in the same tāluka.

(12) The temples of Kāśiviśveśvara, Nameśvara, Nāganātha near Jain temple, Māṇikeśvara near Maskinbhāvi, Kumbhārgiri Īśvara, the Jain temple and the Maskinbhavi, at Lakkundi, tāluka Gadag.

(13) The temple of Śrī Amṛitesvāra at Annigeri, tāluka Navalgund.

(14) The temple of Mukteśvara at Chauḍadāmpur, tāluka Rānebennur.

In his letter No. P.W.D.-41, dated the 8th September 1915, the Collector of **Belgaum** reports his having entered into agreements in the case of the monuments mentioned below and his action has been approved of by Government as per Government Order No. 328, General Department, dated 13th January 1916:—

(1) Group of temples on each side of the Gokāk falls at Konnūr, tāluka Gokāk.

(2) Inscription on a carved stone in a ruined temple on the outskirts of the village Konnūr, tāluka Gokāk.

(3) A ruined temple (of perhaps the 11th century) at Konnūr, tāluka Gokāk.

(4) Fragment of a Western Chālukyan inscription of *Saka* 992 in the temple of Vīrabhadradeva at Belvāḍi, tāluka Sampgāon.

(5) Inscription dated *Śaka* 1141 of the time of the Raṭṭa chieftain Kārtavīrya IV in the old temple of Basava at Nesargi, tāluka Sampgāon.

(6) Small old temple known as Bastiguḍi with four Kadamba inscriptions, two of which are dated *Kaliyuga* 4275 at Degāon, tāluka Sampgāon.

(7) Kadamba inscription dated *Kaliyuga* 4289 in the temple of Basava at Kittūr, tāluka Sampgāon.

(8) Kadamba inscription dated *Kaliyuga* 4282 lying in the village of Bailūr, tāluka Sampgāon.

(9) Two inscriptions of Raṭṭa chieftains, one of which is dated *Śaka* 1086 in the old temple of Śiva at Bail-Hongal, tāluka Sampgāon.

(10) Western-Chālukyan inscription of the time of Someśvaradeva II dated *Saka* 997 in the temple of Śaṅkaradeva at Kadroli, tāluka Sampgāon.

(11) Raṭṭa tablet dated *Śaka* 1130 and 1178 in the temple of Brahmadeva at Hannikeri, tāluka Sampgāon.

(12) Jain temple of Mukteśvara at Wakkund, tāluka Sampgāon.

(13) Two inscriptions dated respectively *Śaka* 797 and 902 in the old Jain temple at Saundatti, tāluka Parasgaḍ.

(14) Inscription against the wall of the temple of Panchaliṅgadeva of the Yādava king Singhana of Devagiri dated *Saka* 1145 at Manoli, tāluka Parasgaḍ.

(15) Inscription in the temple of Udachava of Kandhara or Krishna dated *Saka* 1174 in the fort at Manoli, tāluka Parasgad

(16) Ratta inscription at the waterfall near the temple of Someśvara dated *Śaka* 902 at Sogal, tāluka Parasgad.

(17) Vijayanagara inscription of Krishnarāya dated *Śaka* 1436 in the temple of Yallammā, 2 miles from the village Ugargol, tāluka Parasgad.

(18) Fragment of Ratta tablet dated *Saka* 1168 in the temple of Nārāyanadeva at Badli, tāluka Parasgad.

(19) An old and typical Jain temple in the jungle with fine carving at Nandgad tāluka Khānāpur.

In his letter No. 5370, dated the 21st September 1915, the Collector of K[illegible] the case of the monuments listed t[illegible] y Government as per Government ([illegible] 13th January 1916 —

(1) Inscription in the temple of Madhukeśvara at Banwāsi, tāluka Sirsi.

(2) Inscription in the temple of Mārkandeśvara at Bailūr, tāluka Honawar

(3) Ketpai Nārāyana Devasthān, Sāntappā Nāyak Tirumala Devasthān, Narsimha Devasthān, Joshi Śankara Nārāyana Devasthān, Raghunātha Devasthān, Pārśvanātheśvara Basti and Sānteśvara Basti at Bhatkal in the same Petā

(4) Chandranāth Dev Basti at Hadvalli, Petā Bhatkal.

(c) List of monuments of sub-class (b) regarding which agreements have yet to be taken.

Serial No	Place where the monument is situated		Name or description of the monument.	Class of the monument.
	Tāluka.	Town or village.		
		Poonā District		
1	Junnar ..	Junnar ...	Small Dargā near Habshi Gumbaz	II (*b*)
2	Haveli .	Simhagad ..	Tomb of Rājārām Mahārāj .	"
3	Do. ...	Poonā Cantonment.	A ruined building reputed to have been the residence of the *Kotvāl* of the last Peshvā.	"
		Ahmednagar District.		
4	Ahmednagar ...	Ahmednagar ...	The tomb of Nizām Ahmad Shāh	"
5	Shrigondā ...	Pedgāmv ...	The temple of Lakshmi-Nārāyan	I (*b*)
6	Do. ...	Māndavagan ...	The temple of Devi .. .	II (*b*)
		East Khāndesh District.		
7	Erandol ...	Erandol ...	Pāndavas' Vādā ...	"
8	Pāchorā . .	Sangameśvara	Mahādeva temple	"
9	Chālisgāmv ...	Vāghli ...	Three inscription slabs in the temple of Krishna.	I (*b*)
		Nāsik District.		
10	Yeolā ...	Devthān ...	Hindu temple	"
		Ahmedābād District.		
11	Daskroi ...	Ahmedābād city and suburbs.	Rāni Rūpavati's mosque in Mirzāpūr	"
12	Do. ...	Do. ...	Ahmad Shāh's tomb... ...	"
13	Do. ...	Do. .	Tombs of the queen of Ahmad Shāh.	"

Serial No.	Place where the monument is situated.		Name or description of the monument.	Class of the monument.
	Tāluka.	Town or village.		
		Ahmedābād District—continued.		
14	Daskroī ...	Ahmedābād city and suburbs.	Haibat Khān's masjid ...	I (b)
15	Do. ...	Do. ...	Dastur Khān's masjid ...	,,
16	Do. ...	Do. ..	Sayyad Alam's masjid ...	,,
17	Do. ...	Do. ...	Shāpūr or Qāzī Muhammad Chisti's masjid.	,,
18	Do. ...	Do. ...	Kutub Shāh's mosque ...	,,
19	Do. ...	Do. ...	Sayyad Usmān's mosque and tomb.	,,
20	Do. ...	Do. ...	Shāh Alam's tomb with all surrounding buildings in the group.	,,
21	Do. ...	Do. ..	Bibijī's masjid at Rājpūr-Hirpūr. ..	,,
22	Do. ...	Do. ...	Jāmi' masjid	,,
23	Do. ...	Do. ...	Shāh Khupai masjid ...	II (b)
24	Do. ...	Do. ..	Sakkar Khān's mosque ...	,,
25	Do. ...	Do. ...	Malik Alam's mosque ...	,,
26	Do. ...	Do. ...	Malik Isan-ul-mulk's mosque ...	,,
27	Do. ...	Do.	Mātā Bhavānī's well ...	,,
28	Do. ...	Do. ...	Tīn Darvāzā	I (b)
29	Do. ...	Do. ...	Siddi Sayyad's masjid ...	,,
30	Do. ...	Do. ..	The great mosque	,,
31	Do. ...	Do. ..	Tomb of Mahamad Bigarah ...	,,
32	Do. ...	Do. ..	Tomb of Bibī Rājbāī ...	,,
33	Do. ...	Do. ..	The great tank, palace and harem.	II (b)
34	Dholkā ...	Dholkā ...	Khān masjid	,,
35	Daskroī ...	Daryāpur-Kāzipūr.	Miyā Khān Chisti's masjid ...	,,
36	Do. ...	Rājpūr-Hirpūr.	Ibrāhīm Sayyad's masjid ...	,,
37	Do. ...	Izanpūr ...	Jethābhāī's step well ...	,,
38	Dholkā ...	Dholkā ...	Mālav tank	,,
	Do. ...	Do. ...	Ruined masjid near Tānkā masjid..	,,
40	Sānand ...	Makarbā ...	Tomb of Shaik Ahmad Khatu Ganj Baksh.	I (b)
41	Do. ...	Do. ...	Pavilion in front of the last ...	,,
42	Do. ...	Do. ...	Rauzās of Bāvā Alisar and Bāvā Ganj Baksh.	II (b)
43	Viramgāmv ...	Viramgāmv ...	Mansūr talāv and shrines ...	,,
44	Do. ...	Māndal ...	The Jāmi', Sayyad, Qāzi and Ganjnī masjids.	,,
		Panch Mahāls District.		
45	Hālol ...	Bhāvkā ...	Old ruined temple of Mahādeva...	,,
46	Do. ...	Hālol ...	Tomb of Shikandar Shāh ...	,,
		Thāna District.		
47	Salsette ...	Borivalī ...	A group of memorial stones ...	I (b)
48	Do. ...	Bandrā ...	Fort	II (b)
		Dhārwār District.		
49	Hubli ...	Adargunchi ...	Inscriptions	I (b)
50	Do. ...	Unkal ...	Kalameśvara temple ...	,,
51	Gadag ...	Betgeri ...	Viragal on land of the Hatgera Mallarāya.	,,

Serial No.	Place where the monument is situated.		Name or description of the monument.	Class of the monument.
	Tāluka.	Town or village.		
		Kānarā	*District.*	
52	Kārvār ...	Chitkule ...	European graves about 6 miles from Kārvār across the Kālinadī.	II (*b*)
53	Sirsī ...	Sondā ...	The king's seat	"
54	Kumthā ...	Mirjan ...	Fort	"
55	Do. ...	Do ...	Two inscriptions in the Mirjan bungalow compound and the figure of a tiger.	"
56	Siddāpur ..	Hosūr ..	Carved stones near the temple of Grāmadeva	"
57	Bhatkal .	Bhatkal ...	Lakar's Kamti Nārāyan Devasthān.	"
58	Do. ...	Do. ...	Jattappa Nāyakan Chandranātheśvara Basti.	I (*b*)
59	Do ...	Do. ...	Inscriptions	II (*b*)
		Kolābā	*District.*	
60	Alibāg ...	Agarkot ...	Dominical church and convent ...	"
61	Do. ...	Do. ...	Walls of the fort	"
62	Do. ...	Do. ...	Church and convent of the Augustinians	"
63	Do. ..	Do. ...	Jesuit monastery	"
64	Do. ...	Do. ...	Kothī	"
65	Do. ...	Do. ...	Cathedral	"
66	Do. ...	Do. ...	Chauburjī	"
67	Do. ...	Chaul ...	Mosque	"
68	Do. ...	Do. ...	Hamāmkhānā	"
69	Do. ...	Do. .	Kothī	"
70	Do. ...	Do. ...	Rājkot	"
71	Do. ...	Do ...	Barber's mahall	"
		Sakkar Dis	*trict (Sind).*	
72	Sakkar ...	Sakkar ...	Mīr Māsum's *mīnār* ...	"
73	Rohri ...	Rohri ...	Shrine known as Satyan-jo-thān...	I (*b*)
		Thar and Pārk	*ar District (Sind).*	
74	Nagar ...	Gorī ...	Temple	"

APPENDIX K.

Statement of expenditure on Conservation Works carried out in the Bombay Presidency during the year 1915-1916.

NORTHERN DIVISION.

District.	Tāluka.	Place.	Name of monument.	Amount of estimate.	Actual expenditure during the year 1915-16.	Description of repairs done.	Remarks.
				Rs. a. p.	Rs. a. p.		
Presidency ...	Panvel ...	Ghārāpurī ...	Elephanta Caves ...	2,050 0 0	2,051 0 0	Maintenance of and repairs to piers, etc.	Completed.
Do. ...	Do. ...	Do. ...	Do. ...	85 0 0	85 0 0	Current repairs to custodian's quarters.	Do.
Do. ...	Do. ...	Do. ...	Do. ...	11 0 0	11 0 0	Current repairs to Assistant Custodian's quarters.	Do.
Do. ...	Do. ...	Do. ...	Do. ...	11 0 0	11 0 0	Current repairs to Police Chowki and watchman's quarters.	Do.
Do. ...	Do. ...	Do. ...	Do. ...	241 0 0	244 0 0	Repairing damaged concrete blocks of the landing piers at Elephanta.	Do.
Do. ...	Do. ...	Do. ...	Do. ...	159 0 0	164 0 0	Repairs to the parapet walls and steps of the approach to the caves.	Do.
Thānā ...	Salsette ...	Andherī ...	Jogeshvarī caves ...	319 0 0	181 0 0	Removing silt from the gutter, removing grass and jungle, removing heaps of earth and stone lying in the caves, filling in hollows, repairing cement plaster at places, stone pitching and white-washing, etc.	In progress.
Do. ...	Do. ...	Do. ...	Graves of the two chiefs.	12 0 0	11 0 0	Repairing and white-washing tombs, clearing compound and repairs to inscriptions and putting letters, etc.	Completed.
Do. ...	Kalyān ...	Ambarnāth...	Temple of Ambarnāth.	2,029 0 0	184 0 0	Compound wall repaired where necessary and compound cleared.	In progress.
Do. ...	Bassein ...	Bassein ...	Portuguese remains in Fort.	100 0 0	99 0 0	Removing jungle and grass.	Completed.
Do. ...	Do. ...	Arnāla ...	Fort	79 0 0	70 0 0	Clearing jungle and shrubs all round the fort, making footpath and repairing steps.	Do.
Kolābā ...	Mahād ...	Raigad ...	Shivāji's tomb and Mahādev's temple.	70 0 0	70 0 0	Making pointing to masonry, clearing vegetation and stopping leakages.	Do.
Do. ...	Māngaon ...	Janjirā ...	Kudā caves ...	40 0 0	40 0 0	Repairs to footpath, clearing water tanks.	Do.
Do. ...	Alibāg ...	Alibāg ...	Ruins in the fort ...	100 0 0	96 0 0	Pointing the masonry, restoring part of the fallen wall, repairs to flooring of the temple, removal of wooden gate.	Do.
Do. ...	Mahād ...	Kanzar ...	Footpath from Kanzar to Raigad.	145 0 0	145 0 0	Clearing the roadway and cutting steps in steep rock and providing railing of branches of trees at dangerous places.	Do
Broach ...	Broach ...	Broach ...	Jāmi' masjid ...	2,100 0 0	1,665 0 0	The central water tank dismantled and opened joints of *chhajjā* and central dome closed and other petty repairs carried out.	In progress.
Do. ...	Do. ..	Do. ...	Dutch tombs ...	35 0 0	35 0 0	Ordinary repairs ...	Completed.

NORTHERN DIVISION—*continued.*

District.	Tāluka.	Place.	Name of monument	Amount of estimate	Actual expenditure during the year 1915-16	Description of repairs done	Remarks
				Rs. a. p	Rs a. p		
Panch Mahāls	Hālol ..	Chāmpānir.	Certain monuments	Estimate under reference and not sanctioned	8,667 0 0	Special repairs ...	In progress.
Do ...	Do .	Do. ..	Do.	650 0 0	60 0 0	Providing notice boards	Completed.
Do. ..	Do. ...	Do.	Jumma masjid	166 0 0	100 0 0	Minor repairs and watchman's pay.	Do.
Do. ..	Do.	Do ...	Kevdā masjid	83 0 0	79 0 0	Do ...	Do.
Do	Do ...	Do. ..	Naginā masjid	83 0 0	79 0 0	Minor repairs	Do.
Do	Do	Do .	Bohrā masjid	108 0 0	100 0 0	Do. ..	Do.
Do .	Do	Do	Patār rauzā .	83 0 0	79 0 0	Do. ...	Do.
Do	Do. .	Hālol	Sikandarshāh's tomb	120 0 0	50 0 0	Do .	Do.
Kaira	Mehmadābād	Sojali .	Mubarak Sayyad's tomb.	60 0 0	56 0 0	Do.	Do.
Ahmedabād	Daskroi	Ahmedābād.	Archæological monuments.	828 0 0	567 0 0	Pay of the caretakers	Do
Do.	Do .	Do. .	Do.	1,210 0 0	1,238 0 0	Removing shrubs and rank vegetation, and petty repairs such as filling in cracks, etc	Do
Do. .	Sānand	Sarkhej ...					
Do ..	Dholka ..	Dholkā ...					
Do	Viramgam .	Viramgām ...					
Do	South Daskroi	Sarkhej	Do.	1,400 0 0	1,292 0 0	Removing and renewing stone jali panels which were broken	Do.
Do. ...	North Daskroi	Watva	Old tomb and rauzā.	630 0 0	186 0 0	Cement grouting to aisle arches	In progress
Do. ..	Dholkā ...	Dholka .	Mosque of Balol Khān Qāzī.	1,100 0 0	1,021 0 0	Removing and resetting old work	Completed

CENTRAL DIVISION.

District.	Tāluka.	Place.	Name of monument	Amount of estimate	Actual expenditure during the year 1915-16	Description of repairs done	Remarks
Poona	Māval	Karli ...	Caves ...	550 0 0	517 0 0	Caretaker's pay and ordinary repairs	Completed.
Do .	Do	Do	Do ..	.. ...	165 0 0	Special repairs .	Do
Do ..	Do	Bhājā ..	Do ...	100 0 0	98 0 0	Ordinary repairs .	Do
Do.	Do	Bedsā	Do	100 0 0	97 0 0	Do ..	Do.
Do	Junnar .	Junnar	Do . .	400 0 0	200 0 0	Do ..	Do
Do* .	Shirūr .	Koregaon	Old monuments .	. ....	58 8 0	Do ..	Do.
Sholāpur* ...	Sholapur .	Sholapur	Fort	200 0 0	250 0 0	Do. ..	Do.
Do*	Do .	Do	Old monuments	74 0 0	68 4 0	Providing notice boards to protected monuments in the district.	Do
Ahmednagar	Ahmednagar	Ahmednagar	Damri Masjid ...	20 0 0	20 0 0	Ordinary repairs ..	Do
Do. .	Do. ...	Do	Nizām Ahmad Shāh's tomb	.	248 0 0	Providing expanded metal screens in the archedway openings	Do.
Do	Kopargaon	Kokamthān	Old temple	75 0 0	25 0 0	Ordinary repairs ...	Do.
Nāsik	Nāsik	Pāthardi	Pāndu Lenā Caves		139 0 0	Caretaker's pay ...	Do
Do .	Do	Do. ..	Do	942 0 0	721 0 0	Filling up 2 tanks cut in caves 1 and 24. Construction of 2 masonry pillars 6 and 8 Removal of *débris* from cave 23, *stone preserving by* application of preservative, cleaning 3 water tanks, underpinning in cave No 19 Removal of boulders from cave No. 5.	Do.

*Items included in the list received from the Accountant-General, Bombay.

CENTRAL DIVISION—*continued.*

District.	Tāluka.	Place.	Name of monument.	Amount of estimate.	Actual expenditure during the year 1915-16.	Description of repairs done.	Remarks.
				Rs. a. p.	Rs. a. p.		
Nāsik ...	Nāsik ...	Ankai ...	Caves ...	100 0 0	100 0 0	Ordinary repairs ...	Completed.
Do. ...	Do. ...	Anjaneri ...	Do. ...	312 0 0	251 1 10	Removal of trees from temple, application of scrubs' eradicator, clearance of site, and removal of old white-wash.	Do.
Do. ...	Sinnar ...	Sinnar ...	Gondeśvara temple	503 0 0	264 0 0	Resetting stone struts, improving damaged corbels with cement, applying stone preservative to the porch, improving disintegrated bases of columns in the porch, providing angle iron lintels under fractured stone lintels, repairs to compound wall, etc.	Do.
Do. ...	Do. ...	Do. ...	Do. ...	118 0 0	6 0 0	Improvement to broken parts of images by Meyer's cement.	Do.
Do. ...	Do. ...	Do. ...	Do. ...	1,191 0 0	113 0 0	Purchase of materials of lightning conductor.	An outlay of Rs. 944 was also incurred during 1914-15.
West Khāndesh.	Pimpalner ...	Balsānā ...	Old temple ...	12 0 6	12 0 0	Caretaker's pay ...	Completed.
East Khāndesh.	Chālisgaon...	Pāṭan ...	Maheśvara Mahādev.	26 0 0	26 0 0	Ordinary repairs ...	Do.
Do. ...	Do. ...	Do. ...	Do. ...	1,338 0 0	761 1 2	One rolled steel beam inserted underneath a broken stone supporting the dome. A wrought iron railing was provided round the temple and a notice board erected.	The special repairs sanctioned in 1912-13 have finally finished at a total cost of Rs. 1309.

SOUTHERN DIVISION.

District.	Tāluka.	Place.	Name of monument.	Amount of estimate.	Actual expenditure during the year 1915-16.	Description of repairs done.	Remarks.
Bijāpur ...	Bijāpur ...	Bijāpur ...	Bijāpur Museum ...	944 0 0	944 0 0	Public Works Department share towards contribution.	
Do. ...	Do. ...	Do. ...	Do. ...	200 0 0	200 0 0	Provision of furniture.	
Do. ..	Do. ...	Do. ...	Do. ...	600 0 0	600 0 0	Payment of grant.	
Do. ...	Do. ...	Do. ...	Protected monuments in the Bijāpur District.	2,254 0 0	497 0 0	Providing notice boards.	In progress.
Do. ...	Do. ...	Do. ...	Bokhārā masjid ...	100 0 0	99 0 0	Clearing and removing white-wash.	Completed
Do. ...	Do. ...	Do. ...	Jāmi' masjid ...	408 0 0	408 0 0	Constructing support arches and openings.	Do.
Do. ...	Do. ...	Do. ...	Do. ...	86 0 0	10 0 0	Dismantling masonry from arch opening.	In progress.
Do. ...	Do. ...	Do. ...	Āsār mahall ...	118 0 0	117 0 0	Enclosing exposed ends of R. S. joists and squaring off the newly inserted concrete.	Completed.
Do. ...	Do. ...	Do. ...	Dakhanī 'Idgah ...	417 0 0	214 0 0	Cleaning and disinfecting the place and providing a wire fence.	In progress.

SOUTHERN DIVISION—*continued.*

District.	Tāluka.	Place.	Name of monument.	Amount of estimate. Rs.	a.	p.	Actual expenditure during the year 1915-16. Rs.	a.	p.	Description of repairs done.	Remarks.
Bijāpur ...	Bijāpur ...	Bijāpur ...	Ibrāhim Rauza ..	714	0	0	184	0	0	Construction of supporting arches below gallery	In progress.
Do ...	Do. ...	Do. ..	Mihtar Mahall ..	158	0	0	159	0	0	Scraping away the painting and inserting new jointing	Completed.
Do. ...	Do. ...	Do. ...	Chānd Bāvdi ..	141	0	0	141	0	0	Clearance of rubbish and concreting	Do.
Do. ...	Do. ...	Do ...	Archæological buildings.	2,000	0	0	1,999	0	0	Ordinary repairs	Do.
Do ...	Bādāmi ...	Bādāmi .	Caves .. .	523	0	0	470	0	0	Closing in cement a number of open joints, etc.	In progress.
Do. ...	Do. ...	Do .	Do	72	0	0	72	0	0	Pay of caretaker .	Completed.
Do ..	Do ...	Do. ...	Temples on the hills surrounding Bādāmi.	451	0	0	345	0	0	Replacing the fallen masonry to the north-west angle, etc.	In progress.
Do. ..	Do ...	Pattadakal ..	Temples ...	5,345	0	0	201	0	0	Erecting compound walls and levelling several sites from earth, accumulation	Do.
Do. ..	Hungund ...	Aihole ..	Do	9,747	0	0	829	0	0	Cutting away cactus growth and building of dry stone walls.	Do.
Dhārwār ..	Haveri ...	Haveri ...	Siddeśvara [illegible] mple .	457	0	0	446	0	0	Fixing angles and repairs to pavings and straightening [illegible]	Do.
Do. ...	Hublj ...	Amargol ...	Shaṅkar Linga temple.	596	0	0	596	0	0	Rubble and ashlar masonry	Do.
Do. ...	Do. ...	Unkal ...	Four-porched temple	12	0	0	12	0	0	Ordinary repairs ..	Do.
Do. ...	Rānebennūr .	Chawdadampūr.	Mukteśvara temple .	7	0	0	7	0	0	Do. .	Do.
Do. ...	Bankapūr ...	Bankapūr ...	Nagareśvara temple.	10	0	0	10	0	0	Do. ..	Do.
Do. ..	Gadag ...	Dambal ...	Dodda Basavanā temple.	403	0	0	60	0	0	Erecting rubble stone buttress.	Completed, last year expenditure Rs. 342
Do ...	Do ..	Do. ...	Dcr. ..	422	0	0	422	0	0	Fixing stones in the sanctum towers and fixing spring hinges to doors, etc	Completed.
Do. ..	Do. ...	Lakkundi ...	Kāśīviśveśvara temple.	305	0	0	94	0	0	Fixing expanded metalled doors with spring hinges.	Do.
Do. ...	Do ..	Do.	Nameśvara temple .	70	0	0	71	0	0	Do ...	Do.
Do. ...	Do. ...	Do .	Temples at Lakkundi.	375	0	0	278	0	0	Pointing and filling [illegible] gaps repairing paving, etc	Do.
Do ...	Do. ...	Do. ...	Kāśīviśveśvara temple.	47	0	0	31	0	0	Ordinary repairs ...	Do.
Do. ..	Do. ...	Do. ...	Nameśvara temple	50	0	0	50	0	0	Do	Do.
Do. ...	Do ...	Gadag ...	Someśvara temple	141	0	0	141	0	0	Pointing and fixing stones, etc.	Do.
Do. ...	Do. ...	Do. .	Sarasvati temple	237	0	0	155	0	0	Do. .	Do.
Belgaum ..	Sampgaon ...	Degaon	Temple ..	35	0	0	35	0	0	Cutting broken stones, filling in cracks, etc	Do.
Ratnāgiri ..	Dāpoli ...	Dābhol	Mosque	25	0	0	25	0	0	Removal of vegetation	Do.
Do. ..	Rājāpur ...	Vijaydurg .	Fort wall ..	30	0	0	30	0	0	Do. .	Do.
Do. ...	Mālvan ...	Mālvan	Sindhudurg fort wall	35	0	0	35	0	0	Do. ...	Do.
Do. ...	Ratnāgiri ...	Jaigad ..	Fort wall ..	50	0	0	23	0	0	Do	Do.

SOUTHERN DIVISION—*continued.*

District.	Táluka.	Place.	Name of monument.	Amount of estimate. Rs. a. p.	Actual expenditure during the year 1915-16. Rs. a. p.	Description of repairs done.	Remarks.
Kánará ...	Sirsi ..	Sonda ..	Stone throne ...	15 0 0	15 0 0	Removal of white ants, repairs to roof, etc.	Completed.
Do.*	Bhatkal .	Bhatkal ..	Slab tomb ...	......	2 8 0	Ordinary repairs ..	Do.
Sátára* ...	Sátára .	Karanja (?) ..	Brick column erected by the Emperor Aurangzeb.	......	51 0 0	Providing notice board.	Do.
Do.* ...	Do.	Do. ..	Do. ...	......	163 11 0	Special repairs to Aurangzeb's column.	Do.
Do.* ...	Do.	Sátára ...	Hill and Fort at Sátára.	......	566 9 9	Ordinary repairs ...	Do.
Do.* ...	Jávli ..	Mahábleshwar.	Monuments ...	......	49 4 0	Special repairs to Lodwick monuments.	Do.

INDUS RIGHT BANK DIVISION.

District.	Táluka.	Place.	Name of monument.	Amount of estimate. Rs. a. p.	Actual expenditure during the year 1915-16. Rs. a. p.	Description of repairs done.	Remarks.
Karáchi ...	Tattá ...	Makli Hill ...	Mirzá Jáni Beg's tomb.	90 0 0	159 15 0	Chunam plaster in ash colour.	Completed.
Do. ...	Do. ...	Do. ...	Nawáb Isákhán's tomb.	60 0 0	116 14 9	Flooring and dressed stone slabs.	Do.
Do. ..	Do. ...	Do. ...	Mir Nizámuddin's tomb.	10 0 0	13 10 0	Chunam plaster ...	Do.
Do. ...	Do.	Do. ...	Nawáb Sarfkhán's (?) tomb.	30 0 0	16 9 0	Do. ...	Do.
Do. ...	Do. ...	Do. ...	Mirzá Isákhán's tomb.	90 0 0	14 15 0	Do. ...	Do.
Do. ...	Do. ...	Do. ...	Dabgir mosque ...	120 0 0	69 14 0	Do. ...	Do.
Do. ...	Do. ...	Do. ...	Old buildings ...	120 0 0	120 0 0	Pay of caretaker ...	Do.
Hyderábád ...	Hyderábád .	Hyderábád...	Ghulám Sháh Kalhora's tomb.	119 0 0	120 0 0	Portion of the lower main roof and the whole of the upper main roof, floors, small turrets and some patches were lime-plastered. Parapet wall of well was cement-plastered and several cracks were filled in.	Do.
Do. ...	Do. ...	Do. ...	Ghulám Nabi Kalhora's tomb.	88 0 0	80 0 0	Portion of the roof was lime-plastered and several patches repaired with lime plaster.	Do.
Do. ...	Do. ...	Gidu Bandar.	Erection of a memorial pillar on the site of the old Residency at Gidu Bandar.	4,655 0 0	20 0 0	The amount was spent on collection of materials. The work will be put in hand as soon as the question of site is decided.	In progress.
Do.* ...	Do. ..	Miáni ...	Old monuments ...	......	125 13 0	......	Completed.
Sukkur ...	Rohri ...	Rohri ...	Satyan-jo-Thán (?) ...	200 0 0	202 14 0	The work consisted of chunam plastering the eastern portion of the front walls, white-washing the side rooms, renewing two deodar wood doors and cement pointing the platform all round.	Do.

* Items included in the list received from the Accountant-General, Bombay.

INDUS RIGHT BANK DIVISION—*continued.*

District	Tāluka	Place	Name of monument	Amount of estimate	Actual expenditure during the year 1915-16	Description of repairs done	Remarks.
				Rs a. p.	Rs a p		
Lārkhānā	Dādu	Khudabād	Special repairs to Jāmi' masjid	314 0 0	310 0 0	The work consisted of repairs to minarets and walls and refixing glazed tiles with gypsum plaster, grouting joints and plastering with chunam	Completed
Do	Do	Do	Ordinary repairs to Jami' masjid	78 0 0	63 0 0	The work consisted of closing holes in walls, renewing masonry with old thin bricks, filling joints and plastering with chunam where required	Do
Do	Do.	Do	Yar Muhammad's tomb.	179 0 0	181 0 0	The work consisted of refixing glazed tiles in cement, repairing dome, staircase and roof with plaster and filling in holes with masonry	Do

INDUS LEFT BANK DIVISION.

District	Tāluka	Place	Name of monument	Amount of estimate	Actual expenditure during the year 1915-16	Description of repairs done	Remarks.
Nasrat Canals	Moro	Kubā	Kuba of Nūr Muhammad Kalhorā	233 0 0	234 12 0	Masonry work. Chunam and cement plaster White-wash and painting	In good condition but more repairs are necessary
Do.*	Do	Thūl-Mir-Rukan	Buddhist Stūpa	..	10 10 0	..	
Eastern Nārā	Mirpur Khās	Mirpur Khas	Do	190 0 0	185 0 0	(1) Maintaining caretaker (2) Repairs to road leading to the stūpa (3) Repairing wire fencing and renewing where necessary (4) Cement pointing and mud plaster to the landhi	

* Included in the list received from the Accountant-General, Bombay

APPENDIX L.

A Report on Conservation work carried out in Central India

SPECIAL REPAIRS AT MĀNDU.

Jāmi' Masjid—(1) Dismantled the Gate (2) Restored the left jamb with a bracket on the top as per existing design on the right side. (3) The broken lintel was replaced by a new one and the original moulding on it reproduced. (4) The right side being out of plumb was removed; all the stones were fixed in their proper positions. (5) The black and marble band on the left were removed.

Alamgīr Gate.—(1) Dismantled the cracked pylon or drop wall and rebuilt the same. (2) Underpinned the hole below the stair-way on south and faced it with trap ashler (3) Underpinned the foundations on south side of the main wall.

Baghelkhand.

The Political Agent, Bāghelkhand, has forwarded to me a copy of report from the Secretary to His Highness the Mahārāja of Rewā on the conservation work carried during the year 1914-15. It was received in my Office too late to be included in the last year's Report. It is as follows —

"During the year 1914-15 the Amarkantak temples were visited by a sub-overseer and the temples and the grounds around were cleaned. Arrangements were also made to prevent any damage from cattle.

"Nothing was done for the Piawan inscriptions but the shed over the Allaghat inscriptions which was blown away by a storm was rebuilt.

"At Chandreh as usual the grounds around were cleaned. No further damage was noticed during the year. At Amarkantak it is reported that some branches of mango trees near one of the temples are likely to touch the temple in a high wind. I will try to visit the place this winter and if necessary have the branches removed. It is also proposed to make a detailed drawing of the plinth of one of the bigger temples with a view to its restoration. In the condition that it now is, it is quite likely that parts of it may tumble down any time. There is no carving in these places: so it should not be a difficult work to do. The Chandreh temple also requires similar treatment. The estimates will be submitted after I am able to see the place."

The following is the report received on conservation carried out during 1915-16 in the Rewā State:—

"The Amarkantak temples were visited during the year by a sub-overseer. No further damage is reported. The usual cleaning was done during Shiva Ratri fair.

"No works were found necessary either at Piawan or Alhaghat. The Chandreh temples were visited by the State Engineer in December 1915. No further damage is noticed. The grounds were cleaned as usual. Cultivation was done up to the temple grounds. The attention of the owner of the village was drawn to this. Nothing could be done during the year towards preparing accurate drawings with a view towards restoration of the damaged portions of the plinth of the Amarkantak and Chandrehi temples. Nothing can be done till this is ready."

APPENDIX M.

A Report on Conservation work in Ajmer and Rajputana.

Ajmer.

With his No. 513-S., dated the 27th April 1916, the Secretary, Public Works Department, Rājputānā, furnished me with the following statement of expenditure on the conservation of ancient Muhammadan monuments in the Ajmer Division during the year ending 31st March 1916:—

Locality.	Name of work and description.	Amount of sanctioned estimate.	Allotment for the year 1915-16.	Amount spent during the year 1915-16.	Whether completed, in progress or proposed.
		Rs. a. p.	Rs. a. p.	Rs. a. p.	
Ajmer ...	Repairing Allā-ud-dīn Khān's tomb known as Sol Thambā.	3,781 0 0	2,195 10 4	1,136 3 10	The work has practically been completed with the exception of levelling and dressing. The ground after which the work will be measured up and paid to the contractor finally. Total expenditure from commencement of the work amounts to Rs. 2,721-9-6.
" ...	Excavation in the Arhāī-dīn-kā-Jhuṁprā.	500 0 0	500 0 0	489 12 6	Work completed in March 1916.
" ...	Constructing a Barādari for the Dargah Khwājā Sāhib in commemoration of the visit of the Queen Empress.	4,206 0 0	1,199 2 0	1,199 2 0	Work completed in November 1915 at a total cost of Rs. 4,235-14-0.

Kishangarh.

In his letter No. 2565-S. of the 18th October 1915, the same Officer informed this office that the necessary repairs to the "Kos-Minārs" situated in the Kishangarh territory were carried out by the Kishangarh State during the year 1914-15.

Udaipur.

The Secretary, Public Works Department, Rājputānā, reports that the following monuments, viz., (1) Cheerwaghata Gateway about 8 miles from Udaipur city on the Eklingī road, (2) Chāndpol Gateway and (3) Bari Mahall a portion of the old palace in the Udaipur city and (4) Miran Bāi temple at Chitorgarh received attention of the Udaipur Darbār during the year 1915-16.

Kotah.

The old *chhatris* in Sār Bāgh, the burning ground of the Mahārājās of Kotāh, received the attention of the Kotāh Darbār as usual.

Bharatpur.

The Barādarī buildings at Rupbas, originally constructed of red sandstone by the emperor Akbar, received attention of the State Council.

Dholpur.

Some rooms of the big pavilion of the old palace at Talshac were repaired and converted into habitable rooms under the orders of His Highness. This, I regret to say, is against the spirit of the conservation rules.

Bikaner.

In order that it may well accommodate an Infantry Regiment, the Hanumangarh fort was, under the sanction of Mahākmakhās, repaired partly under the supervision of the Public Works Department and partly that of the Officer Commanding the Infantry Regiment attached thereto The entrance porch of the Sri Karanji's temple at Deshnoke is being made of first class Makrānā marble.

Jhalawar, Bundi, Tonk, Karanli, Alwar, Jodhpur, Jaipur, Kishangarh, Shahapura and Sirohi.

The returns of expenditure on conservation works of ancient monuments during the last official year received from the marginally noted Darbārs are blank

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APPENDIX N.

Inspection Reports.

West Khandesh.

The Executive Engineer, West Khāndesh, favoured me with an Inspection Report and in it he states that out of the Archæological Buildings in his district he inspected the Muhammadan tombs at Thālner in Shirpur tāluka and adds as under —

"There are altogether 10 tombs at Thalner, out of which 7 only are declared to be 'protected monuments' under the Ancient Monuments Act of 1904 They are at present in a dilapidated state and with a view to save these from further decay, it is desirable to carry out repairs, such as eradication of rank vegetation and exclusion of water from the exposed walls . . . .

"The temples at Balsana and the well at Tawalai are in good condition as reported by the Sub-Divisional Officer. I, however, propose to visit these in this month if possible"

Eastern Nara.

The following Inspection Report was received from the Superintending Engineer, Indus Left Bank Division —

"All the remains in this Division were regularly inspected during the year by the Subordinates in charge and were found to be in good condition with the exception of the temple at Virawah which was found to be in a dilapidated condition This temple is considered not worth conserving . . . The Buddhist Stupa at Thul Mir Rukan was also inspected by the Executive Engineer, Nasrat Canals District, on the 8th April 1916

Buddist stūpa at Thūl Mīr Rukhan.

"This is 9 miles south-east of Daulatpur village in the Moro taluka and is in charge of the Sub-Divisional Officer, Upper Dad Sub-Division. During the year under report it was inspected by the Sub-Divisional Officer on the 25th March 1916 and by the Executive Engineer on the 8th April 1916 and the monument was found in good condition

Tomb of Nūr Muhammad Kalhorā.

"This is 7 miles north-east of Daulatpur village in the Moro taluka. It was inspected by the Sub-Divisional Officer, Upper Dād, on 18th December 1915. An estimate amounting to Rs 195 only was sanctioned for repairs to this tomb during 1915-16 but more repairs being found necessary, the amount of Rs. 39 sanctioned for repairs to 'Budhist Stupa' was reappropriated to it, and the whole estimate amounting to Rs 233 was approved of by the Superintendent, Archæological Survey The work consists of māsonry chunam and cement plaster whitewash and pointing was carried out this year from the amount of Rs 233 sanctioned as shown above. In addition some more repairs were also found necessary but they could not be done for want of funds.

Buddhist stūpa at Mirpur Khās.

"This stupa which is situated at Kahujo Dāro about half a mile to the north of the town, close to the Khadro Railway, was inspected by Mr R. S Limaye, Sub-Divisional Officer, Mirpurkhas Buildings, on several occasions during the year 1915-16 and found to be in good condition.

Jaina temple at Gori.

"The Jain temple at Gori was inspected by Mr. R. S. Limaye, Sub-Divisional Officer, Mirpurkhas Buildings, on the 23rd of June 1915. No repairs were carried out to the temple, the work being stopped by the Collector.

Two Jain temples at Bhodesar.

"These are situated 4 miles north-north-west of Nagar Parkar. The temples were inspected by Mr. R. S. Limaye, Sub-Divisional Officer, Mirpurkhas Buildings, on 14th February 1916, who found them in the same condition as before. No repairs were done to them during the year under report as the work was stopped by the Collector.

Stone mosque at Bhodesar.

"This is situated 4 miles north-west of Nagar Parkar. The mosque was inspected by Mr. R. S. Limaye, Sub-Divisional Officer, Mirpurkhas Buildings, on 14th February 1916, and found to be in good condition.

Temple at Virawah.

"This was inspected by Mr. R. S. Limaye, Sub-Divisional Officer, Mirpurkhas Buildings, on 14th February 1916, and found to be in a dilapidated condition. This temple is not considered worth conserving by the Superintendent, Archæological Survey. Hence no repairs were carried out.

Fort at Naokot in Mithi tāluka.

"This fort was inspected by Mr. R. S. Limaye, Sub-Divisional Officer, Mirpurkhas Buildings, on 15th March 1916, and found to be in good condition. No allotment was sanctioned for expenditure during the year under report.

Mosque at Chotiari.

"This is situated 14 miles east of Sanghar and one mile south of Chotiari village in Sanghar taluka. No repairs were done to the mosque during the year under report. It was inspected by Mr. Mohanlal, Sub-Divisional Officer, Nara, on the 17th March 1916, an found to be in a fairly good condition."

East Khandesh. The Executive Engineer, East Khāndesh, forwarded to me the following inspection report :—

Pāndav's Vādā at Erandol.

"The Pandav's Wada at Erandol was inspected on the 30th October last and found in good state. No funds were allotted for its maintenance as the building has been handed over to the Muhammadan Community of Erandol.

Chāngadeva's temple at Chāngadev in Edlābād Peṭā.

"It was inspected on the 12th of January 1916. It was in fairly good condition. No repairs were executed during the year under report.

Mahādeva's temple at Sangamesvara.

"It was inspected on the 27th of February 1916 and it was found in good condition. There was no allotment granted for its repairs.

The Mahesvara Mahādev temple at Pātan.

"It was inspected by Rao Saheb K. V. Vaze, Sub-Engineer, on 23rd October 1915. The special repairs taken in hand in the year 1912-13 were finally completed during the year under report. The rolled steel beam was inserted underneath a broken stone supporting the dome. A wrought-iron railing was provided round the temple and a notice board erected. Besides, a sum of Rs. 25 was spent in keeping the temple in neat and water-tight state.

Mudhāi Devī temple at Wāghli and three inscription slabs in the temple of Krishna at Wāghli, Chālisgāon tāluka.

"These monuments were inspected by Rao Saheb K. V. Vaze, Sub-Engineer, on the 12th September 1915, and reported that they were in good state."

Nasik. The Superintending Engineer, Central Division, forwarded to me a copy of the inspection report from the Executive Engineer, Nāsik, and in it he says :—

Pāndu Leṇā Caves.

"These caves have been inspected by me two or three times during the year. The works as per estimates were practically finished on 27th April, there remaining only the cement grouting of cracks in some of the caves which will be finished in a week or so.

The work of grouting is being done by the Archæological Department, special grouting machine being obtained on loan for the purpose. The caves are in good order and have been so on each inspection.

Ankai Caves.

"Fair order. Some dirty. Sub-Divisional Officer ordered to have them tidied up and red paint markings removed. Also jungle clearing outside and small repairs to weathered portions of rock in front wall of cave No 5

The temple of Gondeśvara at Sinnar.

"The building has been inspected on two previous occasions by me during the last year. The additions and alterations which have been in progress are nearly complete. The lightning conductor has still to be fixed and this will be done in May when it is possible to dig the pit for the earth plate in the quarry close by After this is done the scaffolding which still remains will be removed. The buildings are in good order except weathering and exposed faces.

Hemādpanti temple of Mahādev at Jhodgā.

"No work has been started on the building as the estimate has not yet been correctly prepared by the Sub-Divisional Officer Temple and surroundings tidy Later on the

Temples at Anjaneri

"Tree roots and vegetation removed as per estimate sanctioned for this purpose."

Ahmednagar.

The Superintending Engineer, Central Division, favoured me with a copy of the inspection report from the Executive Engineer, Ahmednagar District, and in it he says :—

Damri masjid at Ahmednagar

Committee of management should be addressed to prevent ling with whitewash and other paints and oil marks

Old temple of Amriteśvara at Ratanwādī

"The temple is in a good condition and does not require repairs

Caves and temple at Harischandragad.

"Caves consist of three halls which are decent enough and are generally used by Officers. The floor and plaster of the walls of main hall have suffered much and they require repairs Two wings of the temple have already fallen and the remaining two are about to fall I do not think that they can be preserved in the sense in which the Archæological Department wishes it to be done The compound wall on the west side has also fallen."

Poona.

The Executive Engineer, Poonā District, reports that he was able to inspect the 16 monuments, viz., Caves at Kārlā, Bhājā and Bedsā, Visāpur Fort, Lohagad Fort, Monument at Koregaon, Tombs of Rājārām Mahārāj and Tānājī Mālusare at Simhagad, Peshwā's bathing *ghāt* at Fulgaon, Caves at Junnar, Caves at Ghātghar, Dilāwarkhān's tomb at Khed, Remains of Shivājī's house at Junnar, Habshī Gumbaz at Junnar, Rājmāchī Fort and Cave temple at Bhāmburdā, and found them in good condition.

Sholapur.

The Executive Engineer, Sholāpur District, reports as follows on some of the monuments inspected by him —

Fort at Sholāpur

"In good order The vegetation should be rooted out and removed.

Fort at Karmālā

"In fair order. A large amount will be required for special repairs to put it in good order. Walls are falling here and there The path on the top of the walls should be made continuous by repairing gaps and removing *débris* The loose stone heaps on the ... removed. Prickly pears and other vegetation growth should ... Care should be taken to see that hollows in the walls are ... e now Endeavours should be made to keep the fort clean and free from vegetation growth from the small grant of repairs.

Viragals and temple of Mahādeva at Velāpur.

"In fair order. Viragals kept outside the Police Chauki should be properly arranged and kept in vertical position."

Thana. The following is an extract from the inspection report received from the Executive Engineer, Ṭhānā District:—

Caves at Kaṇheri.

"These caves are in a fair condition. The up-keep is in hand of the Borivali Khot and the annual repairs are carried out by him.

Franciscan Church, St. Paul's Church of Nossa Senhora Davida, Palace of the Captain of Bassein, Cathedral of St. Joseph, and Dominican Church.

"Jungle growth around all the buildings and inside as well as that existing on walls was cut down and cleared. Cactus growth on top of the same building was also removed. No dangerous part of the buildings has been found to have given way during the year under report."

APPENDIX O.

Report on the usefulness of the Stone Preservative Mixture Szerelemey Liquid.

Regarding the usefulness of the stone preservative mixture "Szerelemey Liquid" the Executive Engineer, East Khāndesh, says that it was tried by him on an old temple with the effect that further decay of the stones was temporarily arrested. But as it is only a year since its first applications nothing can be sa d definitely at this stage about its efficaciousness.

The Executive Engineer, Thānā, says that the liquid was applied to the front part of the cave No. 3 at Kaṇheri in 1914. Its effect is not yet perceptible. There seems no difference in the appearance of the stones which have received a wash of the solution. It seems that the difference cannot be marked in such a short time.

The other Executive Engineers in the Presidency report that they have had no occasion yet to try it.

APPENDIX P.

Report on different methods of staining new stone work.

On enquiries made with the Executive Engineers in the Presidency about the material they used in staining new stone work to the old tint of the surrounding masonry, the Executive Engineer, Kairā and Panch Mahāls, reported "that a fair result would be arrived at if a very thin wash of white cement is suitably coloured and dabbed—not brushed—over the new work. This cement is sold by Messrs. William Jacks & Co."

The Executive Engineer, Kolābā, reported that—

"Last year some repair works were carried out to the ancient monuments at Revdanda and in order to hide the contrast between the new and old stone work, the newly repaired portion was coated or rather rubbed with a composition made of fragments of old stone (from the part which was repaired) powdered and mixed with a little cement and glue. This method produced the desired effect but as the work was only done last year and it has not yet undergone the effects of full monsoon it cannot be still said whether the effect will be permanent but the effect has so far proved successful."

The Executive Engineer, Shikārpur Canals, informed that the following specification and formulas were used in his district:—

"Fresh burnt white stone-lime was dissolved in a tub with a sufficient quantity of water and the whole well mixed. *Surkhi* was then added in the same proportion as the lime and the whole well mixed again. The mixture was then strained through a clean cloth. Clean gum dissolved in hot water was then added in the proportion of 2 oz. to ½ cubic foot of lime.

"The experiment has not proved very satisfactory as the wash has come off in patches already."

The Executive Engineer, Presidency, followed the process given below:—

"Small fragments from fallen portion of the rock, in which the caves are excavated, were powdered and mixed with Portland Cement, and that mixture (a small quantity at a time) was reduced to the consistency of ordinary cement wash by the addition of water and a proportionate quantity of dissolved English glue, colouring pigments being added as necessary to obtain the necessary shade.

"The wash was applied by a skilled painter in 2 or 3 coats and, when dry, was slightly rubbed down with pumice stone.

"This gave satisfactory results"

The Executive Engineer, Ahmedābād, says that the application of mud wash of yellow earth and glue gave satisfactory results.

The Executive Engineer, Bijāpur, tried the following mixture but says it is not found to be permanent for exterior work and has a somewhat patchy effect:—

	Lbs
Gall-nut (*behaḍā*)	2
Catechue (*kāt*)	½
Joggery (*gūl*)	1
Juice of plantain stems (*kelyāche pāṇī*)	2
Lamp black (*kājal*)	1

Archæological Sub-overseer, Mr. D G. Dabholkar, who was in charge of the conservation works in the Bijāpur and Nāsik Districts, reported that he tried the following and found it preferable to any other —

Red stone (Badami) powdered to fine dust ... ... 1 part

Red earth (fine) or charcoal (according to the nature of the colour required) ... ... ¼ part

Gum water to be added so as to reduce the mixture to the consistency of a colouring substance

STAINING MIXTURE.

(a) For interior of buildings.

Building stone powdered to fine dust and strained through dungry cloth ... 1 part

Red earth (fine) or charcoal or colouring pigments (according to the nature of the colour required) ... ... ¼ part.

Gum water to be added so as to reduce the mixture to the consistency of a colouring substance.

(b) For Iron Work.

The proportion is the same but instead of gum water, linseed oil and turpentine should be used.

In both cases the mixture is to be applied with a brush after stirring it each time before use.

NOTE.—In case after application the colouring is found to be too deep, the whole surface should be washed with clean water and rubbed slightly with coir string till the required tint is obtained.

APPENDIX R.

Works proposed for 1916-1917.

(From Provincial Revenues.)

The following are lists of works proposed to be undertaken during the year 1916-17:—

CURRENT REPAIRS.

Serial No.	Name of District.	Locality.	Name of work.	Amount.
				Rs.
1	Presidency ...	Ghārāpurī ...	Repairs to caves and piers at Elephanta.	2,050
2	Do. ...	Do. ...	Repairs to Custodian's quarters ...	85
3	Do. ...	Do. ...	Repairs to Assistant Custodian's quarters.	11
4	Do. ...	Do. ...	Repairs to Police Chowki and Watchman's quarters.	11
5	Ahmedābād ...	Ahmedābād ...	Pay of caretakers for archæological buildings.	830
6	Do. ...	Do. ...	Repairs to archæological buildings at and in the district.	1,450
7	Bijāpur ...	Bijāpur ...	Repairs to archæological buildings.	2,000
8	Do. ...	Do. ...	Grant to Nagarkhānā Museum ...	464
9	Do. ...	Bādāmī ..	Pay of the caretaker for the escav...	72
10	Kairā and Panch Mahāls.	Chāmpānir ...	Repairs to and pay of the caretaker for the Jāmi' Masjid.	160
11	Do. ...	Do. ...	Repairs to and pay of the caretaker for the Kevḍā Masjid.	80
12	Do. ...	Do. ...	Repairs to and pay of the caretaker for the Naginā Masjid.	80
13	Do ...	Do ..	Repairs to and pay of the caretaker for the Bohrā Masjid.	100
14	Do. ...	Do. ...	Repairs to and pay of the caretaker for the Patār Rouzā.	80
15	Do. ...	Do. ...	Repairs to Citadel wall ...	240
16	Do. ...	Hālol ...	Do. Sikandar Shāh's tomb ...	50
17	Do. ...	Mehemdābād ...	Do. Mubārak Sayyad's tomb at Sojali.*	50
18	Poonā ...	Kārli ...	Maintenance of and repairs to caves.	550
19	Do. ...	Bhājā ...	Repairs to caves ...	100
20	Do ...	Bedsā ...	Do. ..	100
21	Do. ...	Junnar ...	Do. .	400
22	Do. ...	Ghatghar ...	Do. ...	50
23	Nāsik ...	Nāsik ...	Repairs to Pāṇḍu Leṇā caves ...	140
24	Do. ...	Ankai ...	Do. caves ...	100
25	Dhārwār ...	Unkal ...	Do. four-porched temple ...	12
26	Do. ...	Chavdadāmpur ...	Do. Muktesvara temple ...	7
27	Do. ...	Haveri ...	Do. Siddhesvara temple ...	15
28	Do. ...	Dambal ...	Do. Dodda Basavana temple.	69
29	Do. ...	Lakkundi ...	Do. Kāśīviśveśvara temple...	47
30	Do. ...	Do. ...	Do. Nameśvara temple ...	50
31	Do. ...	Bankāpur ...	Do. Nagareśvara temple ...	10
32	Karāchi Buildings.	Hyderābād ...	Repairs to and pay of the caretaker for the tomb of Ghulām Shāh Kalhorā.	119
33	Do. ...	Do. ...	Repairs to and pay of the caretaker for the tomb of Ghulām Nabī Kalhorā.	125
34	Karāchi Canals ...	Taṭṭā ...	Repairs to and pay of the caretaker for the tombs on Makli Hills.	520
35	Eastern Nārā ...	Mirpurkhās ...	Repairs to and pay of the caretaker for the Stūpa.	190
36	Do. ...	Bodesar ...	Do. mosque at Bodesar ...	80
37	Western Nārā ...	Khudābād ..	Do. Jāmi' Masjid ...	70
38	Do. ...	Do. ...	Do. Yār Muhammad Kalhorā's tomb.	30

APPENDIX R—*continued.*

Serial No.	Name of District	Locality.	Name of work.	Amount.
				Rs.
39	Nasrat Canals ...	Moro ...	Repairs to the tomb of Mian Nūr Muhammad Kalhorā at Kubo.	75
40	Do. ...	Do. ...	Do. the Stūpa at Thul-Mir-Rukhan.	40
1	Broach ...	Broach ...	Do. the Dutch tombs ...	35
2	West Khāndesh	Balsānā ...	Pay of the caretaker for the old temple.	12
3	East Khāndesh ...	Pāta ...	Repairs to Mahādeva's temple ...	50
4	Ṭhānā ...	Bassein ...	Do. Portuguese remains in the fort.	100
5	Do. ...	Ambarnāth ...	Do Ambarnātha temple ...	50
6	*Kolābā* ...	*Kudā* ...	*Do.* caves	40
7	Do ...	Raigaṛh ...	Do. Shivāji's tomb and Mahādeva's temple.	70
8	Do, ...	Revdaṇḍā ...	Do. the monuments in the fort.	250
9	Belgaum ...	Deogāon ...	Do. the old temple ...	35
0	Ahmednagar ...	Ahmednagar ...	Do. Damri Masjid ...	20
1	Do. ...	Kokamṭhān ..	Do. the old temples ...	75
2	Ratnāgiri . .	Vijayadurg ...	Do. the fort	30
			Total ...	11,489

SPECIAL REPAIRS.

al	Name of District	Locality.	Name of work.	Amount.
				Rs
1	*Bijāpur* ...	*Aihoḷe* ...	*Temples*	*2,000*
2	Do. ...	Pattadkal ...	Do.	1,000
3	Nāsik ...	Jhodgā ...	Manikeśvara temple	1,200
4	Kairā and Panch Mahāls.	Chāmpānir ...	Archæological Buildings ...	2,500
5	Ahmedābād ...	Dholkā ...	Mosque of Balol Khān Qāzī ...	2,000
6	Broach ...	Broach ...	Jāmi' Masjid	694
7	Thānā ...	Kanheri ...	Caves	1,000
8	Bijāpur ...	Bādāmi ...	Dravadian temple	1,035
9	Do. ...	Pattadkal ...	Jain temple in Missionary compound	385
0	Nāsik ...	Ambegāon ...	Mahādeva's temple	550
1	Dhārwār .	Unkal ..	Chandramaulīśvara temple ...	509
2	Do. ...	Dambaḷ ...	Someśvara temple	206
3	Do. ...	Betgeri ...	Vīragals	205
4	Do. ...	Tambur ...	Basavanna temple	316
5	Do. ..	Hangal ...	Vīrabhadra temple	380
6	Bijāpur ...	Bādāmi ...	Bhūtanatha temple	785
7	Fuleli Canals ...	Gaja ...	Buddhist Stūpa	350
8	Ahmedābād ...	Dhoḷkā ...	Khān Masjid	1,000
9	Do ..	Do. ...	„ Tank	500
0	Bijāpur . .	Bijāpur ...	Dakhani 'Idgah	415
1	Do. ...	Do. ...	Badī Kamān	107
2	Do. ...	Bādāmi ...	Banashankarī tank	230
3	Nāsik ...	Anjanerī ...	Old temples	80
4	Presidency ...	Ghārāpuri ...	Police Chowki	84
5	Eastern Nārā ...	Naokoṭ ...	Old Fort	230
6	Bijāpur ...	Bijāpur ...	Notice Boards to protected monuments.	350
7	Belgaum ...	Belgaum ...	Do. do. ...	200
8	Poonā ...	*Poonā* ...	*Kotwāl's Residence situated in the Military Supply Reserve Depôt* compound.	200
			Total ...	18,511

APPENDIX R—*continued.*

(From Imperial Revenue.)

Serial No.	Name of District.	Locality.	Name of work.	Amount.
				Rs.
1	Kairā and Panch Mahāls.	Chāmpānir ...	Archæological Buildings ...	5,000
			Grand Total ...	35,000

PART II (a).

EXCAVATIONS.

Nagarī is 8 miles north of Chitorgarh in the Udaipur State. It was first visited by A. C. L. Carlleyle, Sir Alexander Cunningham's Assistant, so long ago as 1872-73, and an account of its antiquities, which is not a very satisfactory one, has been published in the *Archæological Survey of India Reports,* Vol VI. pp 196-226. The place was visited by me in 1905, and a very brief description of it will be found in the *Progress Report of the Western Circle* for the year ending 30th June 1905, page 58. Therein I have pointed out the mistakes into which Carlleyle had fallen, and referred to the old sculptures, which I discovered and photographed but were not noticed by him.

2. At Nagarī I excavated at two places. The first of these was a mound in the citadel on which is perched a modern temple of Mahādeva. There can be no doubt that it is to be identified with the *stūpa* mound mentioned by Carlleyle. It is true that his drawing of it shows that the mound was rather that locally known as Kunyārdi, 2 miles south of Nagarī, but on the other hand it is to be remembered that he tells us distinctly that it was "within the area of the site of the ruined fortress of the ancient city." This description can apply only to the Mahādeva temple, and not to the Kunyārdi mound. It is true, again, that the "plain, small, modern roofless shrine," which he says was on its top, points to the latter rather than to the former mound which is surmounted by a domed and not a roofless shrine. But the architrave of the Buddhist gateway, alluded to by him as standing on the mound, is found on the former and not on the latter. The truth of the matter appears to be that Carlleyle must have seen both the mounds but that at the time of writing out his description, probably 5 years after he visited the place, he jumbled them together. But there can be no doubt that Carlleyle had the Mahādeva temple mound in view, as is unmistakably indicated by his location of it in the citadel and his reference to the architrave, which are decisive marks.

3. It was rather difficult to start diggings in this mound for fear of destroy-
allings that might have been buried in it. I,
of the mound, and was fortunate enough
on the north side. I commenced work by
was obtained it was smooth sailing afterwards. The extrication of this wall led to the indication of other walls, and the clearing of these last supplied indications of still others, and so on, till we had a regular intricate network of wallings the meaning of which all I could not unravel till the faces of the outermost walls were exposed. It appears that originally we had a square *stūpa* surmounting a platform for the stability of which this framework of wallings emanating from the *stūpa* and from one another was ingeniously constructed. The outer face of the platform, so far as it is preserved, is, as just stated, decorated with mouldings which are of a plain and severe type. An idea of its mouldings can be obtained from photo No. . The severity and the monotony of the outer moulded wall are relieved by providing for three projections in the centre, one on each of the north, west and south sides and jutting out 9′ 8″ from the main line of alignment. The last side was unlike the other sides of the platform and shows that the *stūpa* faced this direction. The maximum height preserved of the outer moulded walls is 4′, and is found on the west side. This seems to be nearly half of the original height of the platform, and it is a pity that the upper half was not preserved. It must doubtless have originally been covered with different types of decorative tiles, some of them probably in string-courses, only a few of which were recovered from the debris lying outside this wall. One type is

represented by what may be called bird terracottas. These consist of moulded bricks, measuring approximately 13″ × 9″ × 2½″ each, with the left end raised into a rim ¾″ × 2″, and the border decorated with an incised line, and holding in high relief either a swan or a pigeon. The third type is represented by human heads, which here seem to have been placed in pairs, one male and one female. The male is invariably an old face and with wonder-struck expression, and the female a young face and either with half-smiling or placid expression. The facial expression and the mouldings of the heads are marvellously naturalistic. The two together have a framing for mask, semi-oval in shape. How these heads were originally exposed to view on the walls is not yet quite clear to me. The third type of decoration consists of bricks, measuring 8″ × 7½″ × 2½″, with oblong bottoms and semi-circular tops. They are carved with lotus flowers of various conventional forms. These tiles must have formed a string-course.

4. It is a pity that only two feet of the *stūpa* have been preserved above the platform. What has survived shows that its corners were recessed and that each side was at the bottom broken up into two niches. One niche on the north has been well-preserved and the other has been partially preserved. Traces of a similar niche were found also on the east side. The sills of these niches marked the original top level of the platform.

5. As might be expected in the case of such an old monument, additions and alterations were made at least twice. The first period of these additions is marked by the rise of the platform top level by at least 6″. Two new walls, one on each side, were also erected on the east part of the platform and immediately in front of the *stūpa*. But the chief peculiarity of this period is the plaster with which both the *stūpa* and the platform walls were covered. The second period is marked by considerable changes which seem to have been carried out in the 5th century A. D. The *stūpa* was converted into a Śaiva temple. A square shrine seems to have been cut out of the *stūpa* in the centre, surrounded by a *pradakshiṇā* or circum-ambulatory passage formed by the outside *stūpa* walls. The shrine was furnished with a stone water channel which was covered and taken underground through the *stūpa* and platform walls on the north. The channel appears to have terminated into a *makara* gargoyle, which is the only portion well-dressed and which must consequently have been exposed to view on the north wall of the platform. The ceremonial washings fell out through the *makara* mouth into a brick cistern from which they were carried westwards to the riverside by means of a drain. This drain consisted of bricks and was covered also with bricks set on edges. Access to the *stūpa* was through two brick wall projections on the east, but the Śaiva temple seems to have been provided with a stone entrance of which only the moonstone, the threshold and the lintel in two fragments were exhumed. The ground floor and the platform top were also paved with stone. But the most notable characteristic of this period was the erection of a *toraṇa* whose remains were brought to light in front of the temple. No *toraṇa* of this period has so far been discovered, and consequently the fragments found are of great interest. Some fragments are no doubt missing, but what remain are enough to enable us to understand the original design of the *toraṇa*. It was a piece of the top architrave of this *toraṇa* that was lying near the modern shrine of Mahādeva on the mound and was thought by Carllyele to have belonged to a "Buddhist gateway." One whole jamb of the *toraṇa* was exhumed though in five fragments. Of the other, several tiny pieces were discovered and these not even in such numbers as to form one whole or very nearly whole jamb. Except about 1′ 6″ at the bottom which is plain, the *toraṇa* jamb has been carved on all its four sides. The jamb is oblong and not square in section. Of the less broad sides the outer is sculptured with a long undulating line consisting of a series of lotus stalks inserted one into the other and with their petals occupying the panels formed by the undulation. The inner side is divided into four compartments by four lotus medallions, and each compartment is decorated with vertical flutes the central of which is carved with a spiral leaves ornament. The broader sides of the jamb are each broken up into five panels and surmounted by a *kīrtimukha*. The panels are topped alternatively by the model of an image pedestal and of the front of the *chaitya* top. The lowermost panels, which are longer than the upper ones, are occupied by a male on the east, and a female on the west, side. The male has matted hair, left hand holds a trident resting

vertically on the ground and his right rests on the knot of his *dupattā* or shoulder scarf near the waist. He also bears a third eye in the forehead. All these are clear indications of his being an attendant of Śiva and show that the *torana* is a Śaiva and not a Buddhist gateway as fancied by Carlleyle. The upper panels are each occupied by a pair of lovers standing near trees.

6 The *torana* seems to have had only two architraves. At any rate fragments of only two were picked up. Of the lower three pieces were found; and, although they do not make up one whole architrave, enough has been preserved to show that originally each broader side was divided into 9 panels. Only one end has been preserved and contains on each side in panel a flying Vidyādhara bearing a garland. The other panels apparently portray scenes from Śiva's life. One of these is clearly occupied by a nude Bhairava with his vehicle the dog. Another holds Śiva seated on a pedestal and below a tree, like Tīrthamkara, with his hands placed one upon the other on the soles of his feet. He bears matted hair and *mundrās* in his ears, and is flanked by four devotees, two on each side. The upper side of this architrave is not sculptured, but the underside bears carving exactly of the style of the inner sides of the jambs. The upper architrave is decorated on each of the broader sides with a repetition of models of the front of the *chaitya* top ending with *makara* mouths. Neither the under nor the upper side is sculptured, but the mortices in the latter show that the gateway was crowned with pinnacles, two at the sides and one in the centre.

7 The second place where I excavated at Nagarī was Hāthi-bādā, about half a mile east of the village. It is an open rectangular enclosure, and is so called because it was used as an elephant-stable when Akbar came and encamped himself near Nagarī, to invest the fort Chitorgarh. The enclosure is 296′ 10″ long and 151′ broad. Traces of a door are clear in the south wall. Whether there was any similar door provided in the north wall it is not now possible to determine, as the greater portion of it has been destroyed. The full height of the enclosure too has been preserved only at a few places. Each wall was originally 9′ 6″ high, is pyramidal in section, and is crowned by a coping stone sculptured into three facets, one horizontal at the top and two sloping at the sides. Now, what could have been the object and age of this enclosure? These were the questions which arose in my mind when I first inspected it. Certainly it could not be a structure of the Muhammadan period, though it was employed as an elephant-stable in [illegible] blocks of stone piled one upon the other [illegible] doubtedly pointed to a period much ea[illegible] connection is worth considering an inscription originally found stuck up in a well at Ghosundī about 6 miles from Nagarī. The inscription has now been removed to the Victoria Hall at Udaipur. It is well known that the stones used in the Ghosundī well as in the archæological monuments at Chitorgarh were all brought from Nagarī, and looking to the massive nature of the block and the peculiar laminations of the stone on which the inscription is engraved, little doubt is left as to its having originally pertained to this structure, whose stones exactly resemble it in these respects. The contents of the inscription also point to the same inference. It speaks of the erection of a *pūjā-śilā-prākāra* by Gājāyana, son of Pārāśarī for *bhagavat* Samkarshana and Vāsudeva. Now, the expression *pūjā-śilā-prākāra* evidently means a worship stone enclosure, i e, a stone enclosure round an object of worship, to distinguish it from enclosures surrounding e g palatial buildings. This description obviously answers to our stone enclosure, and it seems that this contained a shrine of the gods Samkarshana and Vāsudeva. Some more proof, however, was wanted to show that the space enclosed by the Hāthi-bādā was really dedicated to Vaishnava worship. Accordingly, I made a careful inspection of the stones composing the enclosure walls with a view to see whether there were any inscriptions anywhere engraved. One such record was found. Though it was highly weatherworn, there was no doubt that the letters were to be read *Śrī-Vishnu-pādābhyām* and were in character of the 7th century A. D. It was thus clear that upto this time at any rate a shrine of Vishnu was standing here. I have adduced reasons above to show that the Ghosundī well inscription stone originally formed part of the Hāthi-bādā, and it is now necessary to decide how early this structure was in existence and especially whether it was existing during the third century B C. to which period the

inscription has been assigned. The mere architectural style of the building did not give us much help in fixing its age. It no doubt told us that it was a pre-Muhammadan structure, and its massive lithic components indicated that it was to be ascribed to a very early period. But what this early period was the architectural style was unable to tell us, because this was the first structure of its kind. Accordingly I sunk several trenches round about it. Of course, the ground around it was highly undulating, but at the south-east corner where there was the maximum accumulation of debris, coins of *Śibi-janapada* which Carlleyle collected during his stay at Nagarī were found at a level of about six feet above the original ground of the structure. These coins have been rightly assigned by him to the middle of the 2nd century B. C. If these coins are of such an early period and were found at a much higher level than that of the original ground of the enclosure, the latter can easily be assigned to 250 B. C. to which period the Ghosuṇḍī inscription referred to above has to be attributed. Nothing, therefore, precludes us from supposing that the Ghosuṇḍī inscribed stone was originally part of this enclosure and that consequently it enclosed a shrine of Saṁkarshaṇa and Vāsudeva of 250 B. C. at the latest. This is, therefore, the earliest trace of a Vāsudeva temple discovered, the second earliest being that at Besnagar (ancient Vidiśā) which I laid bare near Khām Bābā two years ago and which belonged to about 200 B. C. Very little of the Hāthi-bāḍā shrine, however, has survived; but this need not be wondered at, because very little was found also of the Khām Bābā shrine. All ancient sites have proved mines for exploitation to the people of the surrounding villages and are made to yield materials to build their buildings with. In the case of Nagarī we know that the stone of its ancient magnificent structures has been carried to all the neighbouring villages up to a distance of 10 miles, and was transported in large quantities even to Chitorgarh where almost all the old buildings are believed to have been constructed of materials brought from Nagarī.

8. The coins of Śibi-janapada referred to above bear the following legend : *Majhimikāy[a]* *Śibi-janapadasa* : 'Coin of the Śibi people belonging to the Madhyamikā city'. It is curious that this obvious meaning has not been grasped by scholars and that the legend consequently not properly interpreted. The word *janapada* means both 'people' and 'an inhabited country'. Here doubtless it has to be taken in the former sense, which is confirmed by another type of coins which give the legend *Rajaña-janapadasa*, 'Coin of the Rājanya people'. The word *Rājanya* is not here the Sanskritised form of the Rajpūt title Rāṇā, as is commonly supposed, but is the name of a people, which, at present survives most probably in that of the Rāṇās of the hill districts of the Punjāb and the Rāṇes of the Goa territory. This tribal signification of the word has been known since the time of Pāṇini. It is thus clear that the coins found at Nagarī are those struck by the Sibi tribe. The Śibis are from the Mahābhārata known to have been settled in the Punjāb, and it may be asked how they came so far south as Nagarī which is in the south-easternmost part of Rājputānā. But epigraphists and ethnologists need not be told how the different races of ancient India migrated eastward and southward. And it is no doubt to distinguish the Śibis of Nagarī from those of the Punjāb that in the coin legend mention is made of Madhyamikā which undoubtedly was the old name of Nagarī. Patañjali (*c.* 150 B. C.), the grammarian, speaks of Madhyamikā as being besieged by a Yavana king, and refers to it in such a manner as to show that this event took place in his time. The Yavana or Greek king has long since been identified with Menander, and there can be no question that the town Madhyamikā invested by him is Nagarī. From the ruins and inscriptions found here, Nagarī appears to have been a place of very great importance. One of the inscriptions discovered by me makes mention of an Aśvamedha and another of Vājapeya, sacrifice performed here. Both are to be assigned to the middle of the 2nd century B. C. The place where these sacrifices were celebrated, especially the Aśvamedha, could not but be the capital of a paramount sovereign, who alone is entitled to perform that sacrifice. And it is quite natural that the Greek prince, aspiring to the rank of the supreme ruler of India, cannot possibly leave the king of Madhyamikā (Nagarī) unvanquished.

9. I have described, above, the *stūpa* which I laid bare in the Mahādeva Temple mound. It is, indeed, a very strange thing that we should find here a

brick *stūpa* erected. The whole of the Udaipur State is a hilly region. Nagarī itself is surrounded by hills. And almost all the ancient monuments at present standing here on the ground are of stone At Sāñchī, e. g, which is similarly situated in a hilly district the *stūpas* are of stone Why should we, therefore, find a brick *stūpa* ? In Sind or in the plains of the Punjāb and the United Provinces where stone is scarce the construction of brick *stūpas* is perfectly normal and intelligible. But it is inexplicable in Nagarī where one sees nothing but hills all around and where consequently stone is the natural building material. What is again noteworthy is that the Nagarī *stūpa* is not a plain edifice devoid of all ornamentation but is built of highly decorated mouldings and that the decorative tiles belonging to it which have been described above are terracottas of a high order and will in point of texture and artistic merit bear all comparison to those of the best type that are found in Gandhāra on the north-west frontiers. Why should have this art flourished in Nagarī? The most plausible reply is that it came here with the Śibis from the Punjāb. It, however, deserves to be noticed that whereas some motifs from the Greek art have clearly been borrowed in the Gandhāra, they are conspicuous by their absence in the Madhyamikā, terracottas. The Śibis migrated into the southern parts of Rājputānā about 150 B. C when Greek art had not exercised any influence over that of Gandhāra.

PART II (b).

ORIGINAL RESEARCH.

Valabhi plates.

10. The Curator of the Barton Museum, Bhāvnagar, was good enough to send me for examination two sets of Valabhi copper-plates which were recently brought to light in the Bhāvnagar State. One of these registers a *grant made by Śilāditya III from* Camp Pundhi(?)kāśaka in *Saṁ 347 Vaiśākha su 15*. The earliest date so far known for this prince being 350 (*Ep. Ind.*, Vol. IV, p 76) the present inscription takes the date three years earlier. The grantee is a Brāhman named Saggaḍa *popularly called Dikshita*, son of Sāmbadatta, of the Kauśika *gōtra* and belonging to the Yajurvēda, living at Valabhi but originally come from Pushyaśāmbapura. The grant consisted of three different pieces of land, measuring 100 ... Kakkapadra in the Kālāpaka distr... boundaries of each one of these piec... er of this grant is *divirapati* Madanāditya, son of *divirapati* Skandabhaṭa, and the *dūtaka* is prince Dhruvasēna.

11. The second charter was issued by Śilāditya IV from his camp Mēghavana in *Saṁ 387 dvi-Pausha ba 4* The last date of this Valabhi king being 382, *the present grant brings it down by five years. The donee* is a *Brāhmaṇ named* Dī[kshi]ta, son of Brāhmaṇ Sāmbadatta of the Kauśika *gōtra* and Vājasanēya *śākhā*, originally from Pushyaśāmbapura, no doubt the same as Pushyaśāmbapura of the previous plates. The grant was of a piece of land measuring 25 *pādāvartas* and a well, situated on the north-eastern boundary of the village Maḍasara. The writer of this charter is Mammaka who bears the four titles *Sāndhi-vigrāhika, Divira-pati, Mahāpratihāra* and *Sāmanta*. The *dūtaka* is prince Kharagraha.

12. When the Gujarāt Sāhitya Parishad held its session last year at Surat, many objects of antiquarian interest were exhibited for the inspection of the people. Among these were four copper-plate grants which, after the session was over, I was able to secure for examination, through the kind offices of its Secretary Mr. Ranjitram Vavabhai Mehta who is celebrated for his very keen interest in all antiquarian matters connected with Gujarāt and Kathiawār One of these was found to be the Hansot copper-plate grant of the Chāhamāna prince Bhartrivaḍḍa II dated V. E. 813 (A. D 756), a summary of which has been given by me in paragraph 12 on page 41 of the Progress Report of this Circle for the year ending 31st March 1908. This inscription will be published in the *Epigraphia Indica* by Dr. Sten Konow. Another was found to be the Surat copper-plate charter by the Chaulukya Kirtirāja of Lāṭadeśa dated Śaka 940, a notice of which from the late H. H. Dhruva has appeared in the *Vienna Oriental Journal,* Vol. VII, p. 88. The remaining two grants, however, were found to be new and were both issued by the Solaṅki sovereign Karṇarāja. The earlier of these is dated ... *ēka-triṁ(triṁ)śad-* ... *ēkādaśi-parvaṇi.* The ... grandson of Madhusūdana, of the Māmdavya *gōtra* and originally from ...ēśa. The village granted was Dhāmaṇachha of the Talaha (?) six-hundred in the Nāgasārikā (Nausari) division. The village was bounded on the east by A[jhe]rai, on the south by Toraṇa, on the west by Aśvalasāti and on the north by Kachchhāvali. The writer of the grant was Kēkara, son of Kāyastha Vatēśvara and the *dūtaka,* Śri-Bhōgāditya, Minister for peace and war. The letters engraved in this copper-plate charter were so shallow that no good impression could be taken. The other copper-plate grant of Karṇarāja is a word for word repetition of the first grant except in resp... the date which is not only somewhat different but is also differently wordec ... *śatyāṁ aṅkatopi 996* ... this record were deeply incised, it is not ...

Plates of Solanki Karnaraja.

Kachchhāvalī-grāmaḥ after the specification of the boundaries of the village. The object of making this second copy of the grant is not quite clear.

13. At Nagarī, 7 miles north of Chitorgarh in the Udaipur State, Rājputānā, and where I was encamped last cold season for the purposes of excavation, was found by me an inscription stone of the Gupta period in the house of a Regar called Hariyā. The inscribed stone was originally discovered, I am told, in the citadel about one-fourth of a mile on the south of the present village of Nagarī. The stone had been broken into several pieces, but excepting a few letters at the beginning of the first four lines, the whole record can be read without any difficulty.

Nagari Stone inscription.

14. The inscription begins with a verse in praise of Vishṇu, which occupies the whole of the first three lines and part of the fourth line. There is set forth the date which is V. E. 481. The object of the inscription is to record the erection of a temple to Vishṇu by the three Baniā brothers Satyaśūra, Srugandha and Dāsa. Their mother was Vāsū, and of their father's name the initial letters *Jaya* only have been preserved. They were the grandsons of Vishṇuchara and great-grandsons of Vṛiddhibodda.

15. The most important part of the inscription consists in the specification of the date which has been expressed in the following words: *Kṛiteshu chaturshu varsha-śateshu ekāśīty-uttareshv-asyāṁ Mālava-pūrvvāyāṁ 400 80 1 Kārttika-śukla-pañchamyāṁ.* The first portion of the date speaks of four hundred and eighty-one Kṛita years having elapsed. From the Mandasor inscription of Naravarman discovered by me, we learn that Kṛita was the name of the years of the Vikrama era which are now called Saṁvat. I have also shown in my paper on this inscription that before its discovery there were known at least two records, viz., the Bijaygaḍh stone pillar inscription of Vishṇuvardhana and the Gangadhār stone inscription of Viśvavarman, which contained the mention of Kṛita years. There can, therefore, be no doubt that the word Kṛita of our new inscription has to be taken in the sense of Vikrama saṁvat and that consequently the year 481 is of the Vikrama era. The second portion of the date makes mention of the lunar day in the words: *481 Kārttika-śukla-pañchamyāṁ,* i. e., on the 5th day of the bright half of Kārttika of the year 481. The most interesting expression is that which qualifies *pañchamyāṁ*, viz., *Mālava-pūrvvāyāṁ.* What is the meaning of the word *pūrva* in this expression? At first sight it seems tempting to take it in the sense in which the word has been used in the phrase *etasyāṁ pūrvāyāṁ* which we meet with in Kushana and Gupta inscriptions. But a little reflection will convince anybody that it cannot suit here, because this phrase always follows the specification of the date and not precedes it as in the present record. It is worthy of note that Apte's dictionary gives 'established, customary, of long standing' as one of the significations of *pūrva.* Unfortunately, no reference has been cited in support of it. But the sense suits here most excellently, and, what is more, the phrase *Mālava-pūrvāyāṁ* of our record is thereby brought into consonance with the expressions *Mālavānāṁ gaṇa-sthityā, Mālva-gaṇa-sthiti-vaśāt* or *Mālava-gaṇ-āmnāte* of other inscriptions. *Mālava-pūrva* thus means "established or customary among the Mālavas". Now it deserves to be noticed that the expression *Mālava-pūrvvāyāṁ* qualifies *pañchamyāṁ* (*tithau*). This, therefore, clearly shows that the Mālavas had their own peculiar system of reckoning the *tithi* of the Kṛita (i. e., Saṁvat) year. We know that the years of the Vikrama era found in the old inscriptions present different methods of computation. Thus while some are according to the Kārtikādi, others are according to the Chaitrādi, system. Some *tithis* again conform to the Pūrṇimānta and some to the Amānta arrangement of the lunar months. The Mālava system may have represented one of these two peculiarities or perhaps even a combination of both. Whatever the method of their computation was, this much is certain that not only the *tithis* but even the years were affected thereby. And this is the reason why we find the phrases *Mālava-gaṇa-sthiti* and *Mālava-gaṇ-āmnāta* used in connection with the (Vikrama) years as distinguished from the *tithis.* In the Nagarī epigraph too, the year 481 has for the same reason been expressly included in the specification of the *tithi.* As I have previously stated, the Mālavas had nothing to do with the foundation of the Vikrama era. The old name of the Vikrama years was Kṛita, whatever that name may mean. The connection of the Mālavas with this era was only in regard to the system of reckoning the *tithis* and thereby

the years also. In my paper on the Mandasor inscription of Naravarman I had suspected this, but this is now unmistakably demonstrated by the expression *Mālava-pūrvvāyām* of the Nagarī record used as an adjective of *pañchamyām* (*tithau*).

16. A new inscription has been found in Rājputānā, which is not without some importance. It was for years lying stuck up into a *chabutrā* or platform near Chainrām Agarvāla's *travārī* or step-well at Partabgarh, capital of a Native State of the same name in south Rājputānā. Rai Bahadur Gaurishankar Ojha, Superintendent of the Rājputānā Museum, obtained tidings of it, hurried to the place, and secured the inscribed stone for the Museum through the good graces of the Mahārājkumār of Partābgarh. The inscription is certainly worth editing, and I am glad to hear that the Superintendent has already forwarded a paper for publication to the Director-General of Archæology in India. A summary of its contents will here not be unwelcome especially as the paper will take long to publish

Partabgarh inscription.

17. The inscription begins with the invocation for protection of the god Sun and of the goddess Durgā *alias* Kātyāyanī. The first is no doubt represented by Indrāditya and the second by Vaṭayakshinī of the text The epigraph then divides itself into four parts. The first registers a grant made by Mahendrapāla II of the imperial Pratīhāra dynasty reigning at Mahodaya (Kanauj). The language used in the genealogical portion, characterised as it is by the specification of the names of the queens and the faiths of the kings, is identical with that occurring in the copper-plate grants of his family except in the fact that the portion pertaining to Bhoja II has been omitted from our inscription. The importance of the first part and consequently of the whole record is two-fold. [illegible] prince of the imperial Pratīhāra dynasty, viz., [illegible] nāyakapāla from his queen Prasādhanādevī [illegible] e date of Mahendrapāla II supplied by this inscription is V. S. 1003 (= A. D. 946) For his father Vināyakapāla or Kshitipāla we have dates ranging from A D. 914 to 931. It is worthy of note that this king had also another successor, viz., Devapāla, for whom the date V. S. 1005 (= A. D. 948) is furnished by a Siyadoṇī inscription. It thus appears that Mahendrapāla II reigned between Vināyakapāla and Devapāla Devapāla, [illegible] that Devapāla and Mahendrapāla were not names of one and the same king as is not impossible. In the second place, the importance of this epigraph consists in the fact that it finally sets at rest the controversy that had raged in regard to this imperial Pratīhāra dynasty. Three copper-plate charters were issued from Mahodaya (Kanauj) by the kings Bhoja, Mahendrapāla (I) and Vināyakapāla (Kshitipāla) whose dates were read by Dr Fleet and Prof. Kielhorn as 100, 155 and 188 and referred to the Harsha era. They maintained that these princes could not be identified with the homonymous kings named in the Gwālior, Pehevā and Siyadoṇī stone-inscriptions first because the former bore the subordinate title *mahārāja* and the latter, the paramount titles *paramabhaṭṭāraka, mahārājādhirāja, parameśvara,* and secondly, because the dates of the latter clearly ranged between V. S 960 and 1005 and consequently they were posterior to the former by one full century. Fourteen years ago I wrote a paper combating this view. I contended that the title *mahārāja* did not necessarily denote a subordinate feudatory rank and could be appropriately applied even to [illegible] were wrongly re[illegible] Vikrama era so [illegible] supplied by the stone inscriptions, and that the very fact that there was a perfect agreement not only in the names but also in the order of succession of four princes mentioned in the copper-plates on the one hand and the stone inscriptions on the other, could not be attributed to a mere coincidence but was a conclusive proof in favour of their identity. Three years later a stone inscription was discovered near Sāgartāl in the close vicinity of Gwālior in which the agreement in names and order of succession extended to six generations, and,

curiously enough, it suddenly brought round Prof Kielhorn to my views. It is noteworthy that this new inscription contained no date and that no titles, subordinate or paramount, were conjoined with the names of any kings, and what I cannot understand is why the agreement in point of names and genealogical order was thought by Prof. Kielhorn to be sufficient when it was carried to six generations by this Gwālior record and not sufficient though carried to four generations before its discovery. The present inscription, however, clearly decides in favour of my view. All the names except Bhoja II mentioned in the copper-plate grants are found in this stone record. Secondly the title *mahārāja* which is so far found coupled with the royal names in the copper-plates only is repeated in this stone epigraph. In fact, as stated above, the actual language employed in the copper-plates to describe the genealogy is reiterated in this stone inscription, and to me it appears almost certain that this last is but a lithic copy of the grant originally issued in copper-plate by Mahendrapāla II. Whether we suppose that the grant was originally issued in copper-plate or in stone, the date of the present inscription can be read beyond all doubt; and this is the most crucial point. It is expressed both in symbols and figures. This is a most fortunate circumstance for the reading of figures can never be doubtful whereas that of symbols is still so Leaving aside, therefore, for the present the numerical symbols, the figures indicate that the date is clearly 1003. Here then we have got an inscription which contains a word for word repetition of the genealogical preamble of the copper-plates including even the title *mahārāja* and gives the date 1003 for a son of Vināyakapāla (-Kshitipāla) for whom the date 974 has been furnished in figures and consequently without any doubt by a stone inscription. The conclusion is, therefore, irresistible that the kings of the copper-plates are identical with the homonymous kings of the stone inscriptions and that the correct readings of the dates of the copper-plates which are denoted in symbols are not 100, 155 and 188 as done by Dr. Fleet and Prof. Kielhorn, but 900, 955 and 988 as shown by me and Dr. Hoernle. Now, for the numerical symbols in which also the date of our inscription is expressed. These are *trso, saṁ* and *lri*. Of the first symbol the letter *t* is to be taken along with the preceding syllables *saṁ* and *va* so as to form the word *saṁvat*. This is on the analogy of the dates expressed in the copper-plates of this dynasty. The remainder, viz., *rso*, must be taken to be identical with *sro* and to stand for 100 as ably shown by Dr Hoernle. *Saṁ* must, therefore, be understood to be a multiplicator of the preceding symbol, viz., 100, and consequently to denote the figure for 10. Obviously the remaining symbol *lri* has to be taken to stand for 3. It is only by this interpretation that the symbols can be made to yield the date 1003. Our knowledge of the numeral symbols is yet neither exhaustive nor definite, and the present inscription certainly adds to this knowledge by supplying two new symbols, one for 10 and the other for 3.

18. Now in regard to the details of the first part of the inscription. It records the grant by Mahendrapāladeva (II) of the village Kharpparpadraka near Ghonṭavarshikā and situated in the western division (*pathaka*) of Daśapura to the goddess Vaṭayakshiṇī connected with the monastery of Harirsheśvara, a Daśapura (Dasorā) Chaturvedī Brāhmaṇ. Daśpura has been universally identified with the present Mandasaur in the Gwālior State and is the cradle of a Brāhman caste called Dasorā who are found in numbers both in the Udaipur and Partābgarh States. Ghonṭavarshikā is Ghoṭārsī, 7 miles east of Partābgarh, and Kharparapadraka is Kharot 7 miles south-east of Partābgarh. The *dūtaka* was Jagganāga, and the grant was drawn up by *purohita* Trivikrama. It bears the full date *Saṁvat 1003 Margga vadi 5*, and ends with the sign-manual of one Vidagdha, who probably was governor of the Daśapura division. It appears that Mahendrapāla originally issued a copper-plate charter whose contents were engraved on the stone along with the grants.

19. The second part of the inscription commences with an account of a local Chāhamāna dynasty which made itself conspicuous first in the reign of the Pratīhāra sovereign Bhoja I The first prince mentioned of this family is Govindarāja. His son was Durlabharāja, and the latter's son was Indrarāja who erected a temple to the Sun called Indrāditya after him. Then we are told that at the request of this Indrarāja, Mādhava, son of Dāmodara, granted from Ujjain on the Mīna-saṁkrānti day, after bathing in the temple of Mahākāla and

worshipping the god, a village caled Dhārāpadraka for repairs to and for the performance of *bali* and *charu* sacrificial rites on the site, in Ghonṭavarsha, attached to the god Nityapramudita Mādhava, we are informed, was *Tantra-*

ka and was at Ujjain At that time,
by the Commander-in-chief *Kokkaṭa*,
seems to be no other than Mān.ū in
rrect. Dhārāpadraka can be no other
than Dhār itself This grant is signed by Mādhava and countersigned by Vidagdha of the first grant

20. The third part of the inscription commences with the date *Samvat 999 Śrāvaṇa sudi 1*, and says that on this day *Mahārājādhirāja* Bhartṛipaṭṭa, son of Khommāna, granted to the god Indrarājāditya of G ontavarshā, a field called Vamvvilika in the village of Palāsakūpikā Palāsakūpikā is probably Palāsiā in the Partābgarh State Bhartṛipatta is no doubt the same as Bhartripatta II of the Guhilot dynasty (vide *Ind Ant* Vol XXXIX, page 191 ff) The fourth part registers three minor grants The first is by Devarāja son of Chāmundārāja to the god *Indrāditya* The second is by Indrarāja to the god Trailokyamohana in the grounds of Indrādityadeva The third is by the local banias in favour of Vatayakshini In the last line we are told that the *praśasti* was engraved by Siddhapa, son of Satya; and the inscription ends with the date *Sam 1003*

21. Two copper-plate grants were found at Kurethā in the Gwālior State by Mr M B Garde, Inspector of Archæology He was kind enough to send me impressions of them, from which the following brief account has been prepared Both the grants belong to the Pratihāra dynasty, which succeeded the Kachhvāhās in their rule over Gwālior. The first is dated V. S 1277 and was issued by Malayavarman, who, we are told, was the great-grandson of Natula, grandson of Pratāpsimha, and son of Vigraha and his queen Lālhanadevī The last was daughter of Kelhanadeva, who can be no other than the Chāhamāna Kelhana, ruler of Nādol in Mārwār and for whom we have dates ranging between V S 1221-1240 Her husband Vigraha is represented to have fought with a Mlechchha king, no doubt Qutbuddin Aibak who in A D 1196 "humbled the pride of Gwalior" Their son Malayavarman, the donor of the grant, is, however, mentioned to have seized Gopagiri (Gwālior), which event no doubt refers to the re-capture of the fort by the Hindus from the Muhammadans in the confusion which arose on Aibak's death in A D 1210 (Cunningham's *Archæol. Surv Rep.*, Vol II, p 379, and Duff's *Chronology*, p. 183 This Malayavarman is no doubt to be identified with the Malayavarmadeva of the coins with the dates V S 1280, 1282, 1283 and 1290 which Cunningham found ' at Mārwār itself and in the the neighbouring cities of Jhansi and Gwalior" (*Coins of Mediæval India*, pp 89-91, and *Rep*, Vol II, 314) The occasion of the grant was a solar eclipse which took place on *Samvat 1277, Jyeshtha-Vadi 15 Ravi-dina*. And the charter was issued by Malayavarman after bathing in the river Charmanvatī (Chambal) to two Brāhman brothers Vatsa and Harapāla of the Bheraṇda family and Vāsala *gotra* The second grant was made by Nrivarman or Naravarman, brother of Malayavarman, to one Vatsa, a Gauda Brāhman on *Samvat 1304 Chaitra-śukla-pratipadi Budha-vāsara*.

Kuretha copper-plates.

22 In May 1915 I had occasion to inspect the coins cabinet of the Bombay Branch of the Royal Asiatic Society with the help of Mr K N Dikshit, Assistant Curator, Prince of Wales Museum Three coins struck me as of unusual interest. The first of these was a circular bronze coin of Demetrius *The obverse bears a diademed bust of* the king without elephant's scalp, and the reverse, Heracles seated on rock with a short club in his right hand with the legend ΒΑΣΙΛΕΩ[Σ] ΣΩΤΗ[ΡΟΣ] ΔΗΜΗΤΡΙΟΥ. The unique feature of the coin consits (1) in the occurrence of the epithet of ΣΩΤΗΡΟΣ on the coin of one of the earliest Indo-Greek princes, its use having so far been not known before the reign of Antimachos I, and (2) in the fact that the seated *Heracles type was not known to have descended from* Euthydemus I to his son Demetrius The second is a silver coin of Menander with a bust of Pallas wearing a crested helmet on the obverse, and a circular buckler with an ox-head in the centre. This type has so far been known to us only in copper and is new as minted in silver. The third is a circular silver coin of Havishka of the

Numismatics

NANA-OKPO type. This is the second silver coin found of the Kushana dynasty, the first being of Vima Kadphises. While the coin of Havishka agrees in standard of weight with the silver issue of the Indo-Scythian and Indo-Parthian kings, that of Vima Kadphises was, according to Cunningham, intended for the equivalent of a Roman silver *denarius* though Mr. Whitehead is "inclined to regard it in the nature of a proof-piece."

Mr. N. M. Billimoria of Bhuj sent me some coins for selection for the Prince of Wales Museum. Among these was an oval-shaped copper coin of Andragoras. On the obverse is the head of Alexander the Great, and on the reverse, a horseman, with the Greek legend ΑΝΔΡΑ[ΓΟΡΑΣ] below. Justin tells us that there were two princes bearing this name, both of them Satraps of Parthia. The first was a contemporary of Alexander, and the second was ousted eighty years later by the first Arsaces. The Catalogue of the British Museum makes mention of two coins of Andragoras, one gold and one silver. And Prof. Gardner, the author of the Catalogue, thinks that these belong to the second of these Satraps. Mr. Billimoria's coin may safely, I think, be ascribed to the first Andragoras as is clear from the occurrence of Alexander the Great's head on the obverse.

24. In paragraph 24 of page 7 above, I have spoken about the hoard of coins found in the Jambughodā State, Rewākānthā Agency, and sent to me for examination. Mr. K. N. Dikshit, Assistant Curator, Prince of Wales Museum, was good enough to do it for me. A copy of my report will be found on page 28 above. But here two coins from this hoard deserve particular mention.

MAHOMEDAN.

(1) Circular Silver coin of Muzaffar II, Sultān of Gujarāt (1511-25 A. D.)—
Size : 75; Wt. 109 grains. Mint—Mustafābād. Date 932 A. H.= 1525-26 A. D.
Obv. :—Within peaked square.

السلطان
مظفر شاه
خلد الله ملكه

Outside square, near circular border—

Below : شهر
Right : اعظم
Above : مصطفر
Left : باد

Rev. :—Within circular border—

المويد بتائيد الرحمت شمس
الدنيا والدين ابوالنفر [٢] ٣ [٩]

(2) Same as (1), but date 926 (A. H.) (1519-20 A. D.) which is reversed through mistake.

25. These coins present a hitherto unknown type and show that the Mustafābād (Girnār) Mint was not closed with the reign of Mahmūd Begara but was in use till the end of the reign of his son and successor Muzuffar II.

26. I have refrained from giving any detailed account of the coins referred to in the preceding paragraphs as they were all handed over by me to Mr. K. N. Dikshit for writing a paper on them for the Director-General's *Annual*, where the detailed description will duly appear along with the necessary plate to illustrate them.

PART III.

CONSERVATION COMMENT.

SECTION I.

I have stated above that at Chāmpānir four buildings were taken up for special repairs. The Halol Gateway, being in the most precariously dilapidated condition, had to receive our immediate attention. The abutments had collapsed and the archway was in danger of falling. The return, side and end walls had also collapsed, causing a vast accumulation of debris. The debris was cleared away, but this was no easy work, as the facing stones of the walls had become loose and threatened to fall the moment the debris which held them in their position was removed. Exceedingly great care had thus to be exercised in clearing it away. The face stones of the walls which were ashlar work, were reset, and new ones were supplied to replace those missing. As the debris was removed, small door openings in the return walls were laid bare, each leading to a staircase inside. The staircase was spiral and entirely of stone Each winder was a full stone with one end curved to form its own central post and the other fixed into the wall. On the north side almost all the winders had disappeared, but on the south most of these were preserved, about ten of the middle winders being out of centre or broken, and some on the top missing. After the abutment and return walls were rebuilt, those of the winders that were not broken, were refixed in position, and newly disused ones were substituted for the broken or missing ones. Nearly all the voussoirs of the arch had been shattered and along the intrados there was a crack two inches in breadth The masonry above was in a dilapidated condition, being full of hollows. Cement mortar rendering was applied to the soffit surface, and the arch was grouted from above by means of Sir Francis Fox's grouting machine and converted into one solid compact mass. It gave me great pleasure to find that all repairs to the Halol Gateway were executed thoroughly and according to archæological tenets, except in one respect The side and end walls on the north of the gateway had like others been stripped of their facing, but while the ashlar of those other walls was restored to their original design, here it was replaced by rubble, with the result that we have new rubble work exactly flush with the old ashlar masonry which, to say the least, looks exceedingly incongruous What was here wanted was either the renewal of the whole ashlar facing or the mere strengthening of the walls with rubble underpinning in cement mortar in the more deeply undermined portions, leaving the surface of the repair rough and uneven and not attempting to bring it to a fair face.

2. In front of the Halol Gateway is the Entrance into Chāmpānir city from the main Road. Through the action of the weather, its bricks were so badly eaten away at the bottom that the walls were in imminent danger of collapsing any moment, a condition aggravated by their very great height There were also great heaps of debris and a dense growth of trees and vegetation here. The walls have now been underpinned with brick facing backed with cement concrete The debris and vegetation from the entrance have been entirely removed, and the whole area rendered level, clean and tidy.

3. Another building, which was in a parlous condition and which called next for attention, was that locally known as the Māndvi, which served as the custom-house of Chāmpānir city in byegone days when it was in a prosperous condition. In the centre originally was an arched gateway, of which only six arches have been preserved. The columns, which supported the arch vaulting, being too slender, gave rise to outward thrusts, causing cracks in the vault soffits and displacement in the columns and side walls. The displacement in the olumns has now been counteracted by the provision of iron ties, and that in the ie side walls by the erection of a rubble buttress against each impost The ling between the arches in the north side wall was out of plumb and tilted at dangerous angle. This has all been dismantled and reset. The roots of a e had penetrated into the masonry of the south wall, loosening stones and

overturning parts. The tree was cut down, the roots extracted and destroyed, and the masonry rebuilt.

4. The third monument at Chāmpānir which received attention was the guard-room near the Godhrā gateway. Here no less than twelve lintels had been fractured and were precariously held in position. Eleven of these were carefully jacked up one by one, and supported by angle irons with ends inserted between the lintels and the pillar capitals. While one of the lintels was being jacked up, the floor, which has unexpectedly proved to be hollow beneath, suddenly gave way and the wooden blocks on which the jacks were resting crashed down. The wooden supports resting on the jacks fell at the sides, and the lintel was jerked further out of position. Fortunately no workman was injured; nor was any damage caused to the masonry. A log of a length sufficient to rest on the pillar bases was cut out and so used. As no weight was thus thrown on the floor, no further accident of this nature happened.

5. The Shahr-ki or Bohrā-ki Masjid was next taken in hand for repairs. But nothing of importance was carried out before the end of March beyond clearing a great amount of debris which had accumulated against all the sides except the front.

D. R. B.

SECTION II.

Ahmedabad District.

6. In Ahmedābād, no work of special repair was put in hand during the year, but an expenditure of Rs. 1,680 was incurred upon the maintenance and annual repair of the Muhammadan monuments in the City and district.

7. At Sarkhej, Rs. 1,292 were expended upon the work of renewing stone *jāli* panels, which had latterly been broken, in the Zanānā Palace on the west side of the great tank.

At Dholkā, certain structural repairs upon the mosque of Bahlol Khān Qāzī were undertaken at a cost of Rs. 1,021. The work here consisted principally in dismantling and rebuilding a considerable portion of the wall at the south west corner of the mosque, which was in precarious condition.

East Khandesh District.

8. In East Khāndesh district, the repair of the old temple of Maheshwar Mahādev, at Pātan, has been completed at a cost of Rs. 1,509, of which Rs. 762 were spent during the year under report. The work was comprised by the insertion of rolled steel beams to support a broken lintel under the dome, and the erection of an enclosing railing about the temple, after the encroaching jungle growth had been cleared.

Nasik District.

9. At the Pāṇḍu Lenā caves, in Nāsik district, Rs. 721 were expended upon necessary repairs in the way of constructing masonry piers, etc., in support of dilapidated portions of the cave fronts, filling with rammed earth a couple of small tanks where the annual water accumulation was causing the sculptured rock face to become badly disintegrated, removing fallen debris from certain of the caves and generally putting the whole in order. Stone preservative solution was also applied to the disintegrated surfaces of some of the sculptures and carvings.

10. At Sinnar, special repair was carried out upon the temple of Gondesvar, where some damaged corbels and the dilapidated bases of pillars were strengthened with cement, angle iron inserted to support fractured stone lintels, and steps taken to arrest the decay of some of the sculptural carving by the application of stone preservative. Materials have been purchased for a lightning conductor, the need for which was apparent when this temple was struck and somewhat damaged by lightning a few years ago; while the images which were wilfully damaged here in the previous year have been pieced together with Meyer's stone cement.

At Anjaneri, also in the Nāsik district, measures have been taken for the conservation of the rock-cut caves, Rs. 252 being spent upon removing jungle, clearing debris and generally putting the site in order.

Bijapur District.

11. At Bijāpur, in addition to an expenditure of Rs. 2,000 upon the maintenance and current repair of the historical buildings, a number of minor special works were undertaken. At the Jāmiʿ masjid a dilapidated archway in the northern aisle, which was

previously blocked up with infilling, has been properly secured, and the way opened out again Similarly a supporting arch was also found necessary under a portion of the gallery ceiling in the Ibrāhīm Rauzā. The Chānd Bāvdi has been cleared of rubbish and put in order; while steps have been taken to prevent the abuse of the Dakhanī 'Īdgāh, as a latrine, by the local inhabitants.

12. At Aihole; a further sum of Rs 829 was expended on the work of cutting away encroaching jungle and building dry stone walls about the many important old temples in this locality, similar works also being undertaken at Pattadkal in the neighbourhood at a cost of Rs. 201 during the past year; while at Bādāmī, in the same district, minor repairs were in execution upon the Jain and Vaishnav caves, and necessary works have been put in hand upon the Dravidian temples in the surrounding hills, underpinning and securing dilapidated masonry being the principal items involved

Dharwar District.

13. At Dambal in the Dhārwār district the temple of the Dodda Basāppā has received further attention. Radiating rubble stone buttresses have been erected in temporary support of the bulging portions of the circular *śikhara* façade and the displaced carved stones in the upper portion have been refixed. The work here is one demanding considerable circumspection and care in its execution owing to the loose nature of the rubble core, through the displacement of which the outer wrought facing of the walls has been forced precariously out of place.

14 At Haveri, in the same district, necessary works upon the temple of Śiddheśvar were undertaken at a cost of Rs. 483 The work consisted primarily in inserting angle irons to provide needed support to the widely projecting *chajjā*, straightening inclined shafts and columns, and resetting the uneven paving, while at Amergol, Hubli tāluka, the temple of Śankarling was repaired at a cost of Rs. 596, the work being comprised principally by the underpinning of overhanging masonry, the refixing of displaced wrought facing stones and generally securing the temple fabric from further dilapidation. The site has also been cleared up and put in order.

Broach District.

15. At Broach, towards the repair of the Jāmi' masjid Rs. 1,665 were spent in the past year. The work was comprised by minor repairs to the *chajjā* and dome, eradicating ingrown vegetation—a fair portion of the masonry had to be dismantled for this purpose, and rebuilt—and putting the mosque enclosure in order. A latter-day erection in the form of an enclosed tank which disfigured the front of the *masjid* was also dismantled and removed.

Ahmednagar District.

16. At Ahmednagar, expanded metal screens have been provided in the arch openings of the façade of Nizam Ahmad Shāh's tomb to exclude cattle and birds, which were a considerable nuisance here

Sind.

17. In Sind, attention was given to the Jāmi' masjid at Khudābād in Larkhānā district, where the walls and minarets were repaired and the glazed tiling—a special feature with these monuments of Sind—was secured. Needful repair of the chunam plastering was also carried out here; while similar items of repair were also undertaken upon the tomb of Yār Muhammad Kalhorā in the same locality—the combined cost of these works amounting to Rs. 490 The tomb of Nūr Muhammad Kalhorā at Moro was also put in repair at a cost of Rs. 235, measures of the nature of those noted above being undertaken here also

18. At Hyderābād (Sind) similar petty repairs were carried out upon the tombs of the Ghulām Nabī and Ghulām Shāh Kalhorā; and, again, at Tattā among the early Muhammadan tombs on the Makhli Hills.

19 The above remarks deal with the more noteworthy monuments upon which conservation work has been carried out in the year under review. For further details of the work undertaken in the Western Circle, and the expenditure incurred, a reference is invited to the information compiled under Appendix K.

20 The following notes are in connection with some of the more important monuments visited in the course of a cold weather tour:—

Kanheri Caves.

Of the ninety-nine numbered caves plotted upon the survey map appearing in the Thānā Gazetteer, the important ones calling for conservation attention with some urgency are those numbered 1, 2, 3, 10, 21, 35, 56, 65 and 66. As is inevitable in dealing with such rock-cut non-structural monuments comprehensive measures of repair are scarcely possible, and the recommendations put forward must be, in some degree, tentative and experimental. In the case of the Kanheri excavations the friable nature of the rock in which they are cut further complicates matters, for here certain of the rock strata approach laterite in substance, and are badly disintegrated.

Thana District.

21. Much water floods over the projecting fronts of the caves in the yearly rains, to the further detriment of these decaying portions, and this must be prevented or, at any rate, minimized before any satisfactory measure of repair can be assured. Happily, as was discovered upon climbing over the tops of some of the caves, original catch-gutters exist, cut by the excavators of the caves. These original channels are now defective in several places, grown with vegetation and blocked with stones; but much can be done by clearing and mending them towards diverting the monsoon rain spouts from the cave fronts.

22. The weathered surface of the rock excavations, even where it is not badly understruck and deeply decayed, is very friable and disintegrating; and it is doubtful if the application of any stone surface preservative will materially help matters for any length of time. However, as this appears to be the only means of repair possible, its application has been recommended. Inscriptions, the disintegrated surfaces of sculptures and of those structural members not deeply undersunk and decayed to the detriment of their structural functions will be treated with Szerelemey's fluid preservative to arrest the present decay; but in the case of columns that are deeply decayed and diminished in requisite strength I have recommended that they be made out to their original size and simple shape with a facing of large blocks of stone, carefully dressed to conform with the texture of the adjacent rock, the joints being worked extremely fine, so that no cement mortar is needed in the beds; the intention being to make the joints very unobtrusive and preserve the effect of the original monolithic construction as far as is possible. Practically all of the columns needing such repair are plain. Octagonal or square shafts should lend themselves well to this treatment.

Portuguese remains at Revdanda.

23. Generally these old remains are much overgrown with vegetation and large roots, which accentuates their appearance of dilapidation and neglect. In the case of the palm and cocoanut trees densely growing in most of the roofless interiors of these monuments, the circumstances do not permit of their removal and clearance, as these privately owned monuments stand on privately owned land, the value of which is directly related to the very considerable fruit crop which it yields. Thus, except in the case of the four monuments which it has been found necessary to acquire, the general removal of these trees is out of the question.

Kolaba District.

24. Except for the fact that these trees and palms are growing within the four walls of these privately owned monuments, there is little objection, in my view, to their remaining; for, as fruit trees and therefore, a source of income, they are carefully kept, and, while not detracting unduly from the old ruins, are very pleasing themselves.

25. The many roots and the jungle growing thickly upon the actual walls of the ruins will be eradicated, except in those few individual cases where this would weaken the old structure and tend to its further decay.

26. In the case of the monuments to be acquired much can be done to conserve them and improve their general appearance by carefully levelling the ground in and about them, draining it to suitable falls and laying the interior with well rammed murum. Cracks, gaps and fissures in the old fabric can be profitably closed with concrete (of fine aggregate) or cement grout, as is

individually the more suitable, the adjacent work being first saturated with water to ensure better permeation and a more homogeneous repair.

THE DOMINICAN CHURCH AND CONVENT.

27. Little remains of this building beyond the chancel, originally roofed with a barrel vault of square "Roman" coffering, but now open to the sky. The chancel-arch, however, still exists intact; and along the south side of the nave little vaulted chapels project, with their quasi-Gothic ribbing in intersecting, if indecorous, contrast with the more general features of early Renaissance persuasion. This range of little chapels is half fallen, leaving the core of their vaults exposed; but this and the ruined chancel alone remain of the now naveless church.

28. However, in conservation, much can be done by means of the general measures; while jointing the exposed fractured face of the chancel vault core will further conduce to the preservation of this the one monument, seemingly, which retains any portion of its original *decorated* vaulting.

THE KOTHI.

29 A small building (of religious persuasion, it would seem, from the Maltese cross used in decoration of its entrance doorway) and, apparently, originally a chapel. What appears to be a range of small vaulted chambers is now to be seen through the broken floor. The roof of this small building is intact, and also takes the form of a barrel vault; quite plain, however, as distinct from the fragmentary remains of the decorated Dominican vault above mentioned. This, I am informed, is the only vault existing complete in this locality.

30. The floor is to be cleared of dust and debris, but the exposed vaults therein will not be disturbed. In addition, the general measures previously noted will be undertaken.

ST. BARBARA'S TOWER.

31. The Sāt Manzli as it is locally called is practically all that remains of an extensive original fabric of which it was once part It is in fair condition, and the execution of the general measures of repair recommended will do much towards it conservation

32 The Fort wall will also receive some attention towards its preservation, particularly with regard to its better preserved portions, as for instance, those about the "*Land*" and "*Sea Gates*"

33. The wall top is to be tied up, the earth, both here and at the base, levelled more; large roots eradicated, and the other general measures recommended put in hand, as necessary.

34. On the wide top of the wall by the Land gate I noticed above a dozen original cannon whose trunnions had already received some attention, while, scattered about the village in this fort, were many stone cannon balls which, possibly, were shot into the fort by an occasional invader, for they are lying in all sorts of positions among the jungle and I discovered no mortar in the fort that could have discharged them They will all be collected and stored in order inside the connecting way between the double entrance chambers of those two gates.

THE MUHAMMADAN REMAINS AT CHAUL NEAR AGARKOT.

35. *Tomb of Angria.*—Very much of this structure is missing, but what remains is very well preserved, especially in respect of its mouldings and ornamental features It is of carefully wrought stone, with mouldings and features particularly refined in contour and in effect, and appears, both as to architectural design and material, to be quite exotic to this locality which, I am informed, produces practically no "free stone" at all.

36. This, the reputed tomb of a Marāthā Sardār, is Indo-Saracenic in style. It is sadly neglected at present, and does duty as a rubbish receptacle and drying ground for dung cakes for an apathetic owner, whose concurrence should be sought to its rescue from such maltreatment.

37. The ground about it is crowded with the inevitable palm trees which encroach upon the tomb, and I have recommended that a surrounding space of at least 5 feet to be cleared and levelled. The rubbish generally will be cleared from the interior; and the whole earth infilled portion brought up to the level of the sides, the small trees growing therein being removed altogether.

38. The open joints in this thirty bedded masonry exterior show, in some places, right through the wall thickness. They will be closed with cement grout carefully prevented from appearing upon the finely wrought surface.

The Hammam.

39. A domed chamber, its square plan reduced by short angle splays to the form of an irregular octagon, from the larger sides of which, to north and south, projects a low deep arched recess. At the south-east angle projects a small chamber containing a little plunge bath; and the south-west opening corresponding gives access past the buttressing range of vaults (taweli ?) lining the road. The domed central chamber is now open to the sky in its extreme centre, from which a previous roofing feature would appear to be missing.

40. This monument appears generally in fair structural order; but the jungle and roots, etc., will require to be cut and cleared away, the floor of the domed chamber levelled and rammed with murum, debris cleared, and the immediate site made more tidy, levelled and drained to falls. Any little patching or underpinning that may be seen to be necessary upon the clearance of jungle, etc., will also be undertaken, rubble masonry similar to the present old work being used.

41. A large nameless masjid, much ruined, which, but for its being the only structure of its kind in this locality (as my information goes), would not warrant the expense of conservation. At the north-east corner the few bays of vaulting remaining of the fallen outer aisle are themselves very much dilapidated, and threaten to fall at any moment. Repair here is out of the question, and these threatening portions will be carefully dismantled, so as not to disturb the main fabric. The roots and jungle growing upon the building will be cleared and the ground immediately about it levelled somewhat, and made more tidy. The trees growing close against the old walls will be cut down. The higher dome, emphasising the central bay of this now opensided structure, appears to be fairly intact; but the loose portions of its original concrete casing will require to be secured with cement.

Rajkot.

42. The Rājkot, the citadel of Mussulman Chaul, is now, I fear, ruined beyond the possibility of profitable repair. Fragmentary lengths of dilapidated wall rise from their own debris, and are so interwoven and ingrown with jungle roots as to make their clearance practically out of the question. I have recommended, however, that their demolition should be rigorously prevented, and that these old ruins be permitted to fall into inevitable further decay as tardily as possible.

Old Sea Fort at Vijaydurg.

43. This old fort was visited at the request of the Executive Engineer for the purpose of advising as to the desirability of undertaking active conservation measures to its sea walls which, in several places, have been seriously undermined by the action of the sea.

Ratnagiri District.

44. On the whole, this old sea fort, with its three main tiers of defence, is comparatively in a fair state of preservation; most of its original features remain and, being founded generally upon the solid rock, are likely to remain indefinitely. In the case of the dilapidated portions of the sea wall it will be impossible, on the score of prohibitive expense, to consider the repair of the more badly damaged portions which, while not threatening imminent fall, must unavoidably now be left to the mercy of the sea. Generally the ground rock behind the sea wall rises sharply up to the next tier, and I do not anticipate that the fall of one fragment will be materially detrimental to any but its immediately adjacent portions of the wall. if to those. In many places, however, the dilapidation is only

starting and, it would seem, can be remedied without any great expense. Small patches of fallen facing at the sea line can be replaced and open jointing at this level closed with Portland cement mortar, which will do much to arrest the dilapidation of these less damaged portions and make for their continued existence for many years to come.

45. I have asked in my notes that all items in the estimate to be submitted be given separately, so that they may be considered individually on the score of warrantable expense. I suggested this, as it will be quite impossible to put the whole of the walls into a satisfactory condition (a rough estimate for which purpose by the Executive Engineer amounts to some Rs. 60,000). On the other hand it is undesirable, in my view, to abandon them altogether, and where it will be possible to undertake an economical repair which will not be prejudiced by the possible further ruin of the more dilapidated parts, I think this should be done.

THE TEMPLE OF RUDRA MALA AT DESAR.

Panch Mahals

46. An interesting, though much ruined, little Śaiva temple of the late Solañki period; a distinctive and, from an æsthetic point of view, appropriate feature being the apt reiteration of attached columns and capitals in the angle projections of the lower *śikhara*, echoing their free stand fellows in the now fallen *mandapa*. This happy feature, by no means common, is also to be noticed in the collection of temples at Kirādu, Jodhpur.

47. Little in this way of conservation is possible to the fragment of a temple now remaining, which is solely comprised by the shell of the lower *śikhara* The jungle will, however, be cleared, particularly that upon the roof, and the slightly shifted masonry of the carved centre panel on the south face reset when the root that has forced it forward has been removed A slightly displaced column on the south flank of the shrine opening will also be reset vertically, and the tiled cap properly replaced. The gaps and the hollows behind the outer wrought facing of the walls will be closed with concrete The ground about the temple for a distance of 15′ is to be cleared of debris and jungle and made more level; the wrought and carved stones recovered in the process being ranged in order, and according to their kind, around the space cleared at the 15′ limit The fallen stones encumbering the shrine interior will be brought out and placed with them.

EK-MINAR-KI-MASJID, CHAMPANIR

48 This structure might be more correctly described as *Ek-minār masjid-kā*, for, of the original structure, one solitary minar remains standing among such general debris as is now left.

49. The minar is singularly intact, not a portion of it is missing from the complete whole; while it is extraordinarily graceful and of excellent design. A rather remarkable feature in connection with it is that the minar for its whole height, with the exception of only the lowest storey, was quite separate and detached from the structure of which it was originally intended to form part. This, if a mosque, would have been an exceptionally low one for its height where connected with the minar was not more than 12 or 14 feet externally, as one may discern from the disturbed facing at the back of the minar; though a similar arrangement exists, of course, in the case of Bohrā-ki-masjid.

50. It would appear that this stone minar was built as a commencement towards the erection of a stone structure, probably a mosque, and that the intention was that this minar, with another to form the usual pair, would be placed in the centre of the façade. At present, however, the remains of a small brick mosque project from one side of the minar; but the brick structure is so placed as to bring the solitary stone minar at the end of the façade; a circumstance pointing towards a probability of the brick mosque being a later addition, erected in the place of a stone structure originally intended but, seemingly, never built.

51. In this minar arched openings on both east and west faces of each of the four upper tiers exist, giving access to the encircling galleries—a multiple feature obtaining in no other *minār* in Chāmpānir.

52 A few repairs of a minor nature will be put in hand to conserve this monument and the remains of the later brick monument will receive similar

attention. A pathway through the jungle from the main road, a distance of about one furlong, will also be cleared for easier access than at present obtains.

PANCH MAHUDA-KI-MASJID, CHAMPANIR.

53. It has also completely disappeared with the exception of one whole minar and the lower half of the corresponding one. This latter is so precariously dilapidated that it may come down at any moment. Its more complete fellow appears, however, to be capable of repair, which would be comprised by filling gaps in the exposed core of lower portion where originally attached to the fallen mosque, and by replacing the missing arch on the west face in the upper brick portion of the minar. The interior of the exposed lower core would further require to be treated with injected cement grout, a little simple underpinning also being done to the base.

54. The question of repair to this minar is, however, closely related to the condition of the old rauzā just beside it. This latter structure—which, in the absence of any mosque, is, assumedly, the "protected monument" of the notification—is in a very ruinous condition. This is very unfortunate, for it has been a tomb of considerable architectural merit, and much of the delicately worked ornament still exists, albeit somewhat weathered and decayed.

55. The whole structure is badly shaken—arches shifted bodily along their voussoir beds, and facing hanging precariously inclined in considerable patches; while most of the dome had fallen long ago. One of the main corner piers has disappeared altogether, with the exception of two planes of thinly-dressed facing masonry, upon which the weight of whole superstructure at this angle is most precariously balanced. This angle may fall at any moment and, in my view, is too dangerous to warrant exposing workmen to the risk attending any attempt towards its repair. The fall of this angle is imminent and, I think, inevitable; but if, afterwards, the remainder of the structure is left in a reasonably stable condition, a little attention will be expended upon it, such as clearing the jungle growth from inside the tomb and about it up to a limit of 20 feet. The floor will then be cleared of debris and levelled, and the present graves, which have been disturbed by treasure seekers, apparently, reset in position; the ornamented stones in the debris being set out in order outside the tomb.

56. If the one whole minar remaining suffer no appreciable detriment through the fall of the considerable mass of masonry in its immediate vicinity, the simple repair above recommended will then be carried out.

TALPUR TOMBS.

Hyderabad District.

57. These tombs were visited at the request of Commissioner in Sind for the purpose of ascertaining the desirability of including them in the list of "protected monuments," and for the issue of definite recommendations with regard to their repair.

58. From an architectural standpoint this collection of Tālpur tombs is conspicuously inferior to the tombs of the Kalhorās situated but a mile away; while the quality of the *kashi* work falls pronouncedly short of that remaining upon these latter monuments which antedate the Tālpur tombs in period by one half a century, a further instance only illustrating the unhappy fact of the continuous degeneration of Indian art down to the present day.

59. The tombs are all, archæologically speaking, quite modern, the earliest of the more important graves being that of the reigning Tālpur Mir Murād Ali Khān, which is dated 1229 A. H. (1813 A. D.) while the building containing this grave is dated 1254 A. H. (1837 A. D.) on a tablet over the entrance.

60. Personally, I am of opinion that the primary ground upon which the conservation of these monuments can be considered is the historical one, and from this aspect I think that the claims of the monuments can be justly met by restricting repair to these tombs containing the bodies of the more historically important of the Tālpurs, namely the reigning chiefs.

61. This limits the tombs to which active conservation measures would be undertaken to those noted below:—

Compound No. 1—

Tomb No. 1, in which are buried—

(1) Mir Murād Ali Khān	(1229 A. H.)
(2) Mir Nūr Mahomed Khān	(1256 A H.)
(3) Mir Nasir Khān	(1261 A. H.)
(4) Mir Shāhdād Khān	(1274 A. H.)
(5) H. H. Mir Mahomed Hussen Ali Khān	(1295 A. H)

Tomb No. 5, in which are buried—

(1) Mir Karam Ali Khān	(1244 A. H.)
(2) Mir Hāji Mahomed Khān	(1287 A. H.)

This latter tomb, architecturally, is far superior to the former, and is probably the best of the whole group.

62. In notifying these two tombs as "protected monuments" under classification II (*b*) it will, perhaps, be desirable to include also the remaining monuments to which conservation repair is not contemplated; in which case these latter should be specifically notified under classification III. The monuments in compound No. 2 will also thus come into this latter group.

63 With regard to the conservation measures desirable, these will be principally comprised by the repair of the existing tile work, to which considerable attention will be needed.

64 The mode of applying the original tiles, as is revealed through certain of the fallen patches, was a very extraordinarily one from a constructional point of view. The whole tiled surface, it would appear, is merely an extremely thin skin, attached to the main wall of the structure at horizontal intervals of about a foot ... sters, so that between the skin of tiles, affixed to its ... f plaster, and the main wall of the structure exists ... 9" in depth The reason for this constructional ... ery prejudicial to the preservation ... from which portions have already fallen.

65. In repairing such places it will be necessary to close the hollows exposed with cement concrete, which will be afterwards plastered to match, and to align with the surface of the mortar backing immediately behind the tile

THE GREAT IMAGE OF RISHABHA AT BARWANI.

Central India.

66 This image, popularly known as "Bāvan Gaz," on account of its height 52 *gaz*, is carved out of the south face of the hill side from which it projects in medium relief. The head and shoulders remain in excellent preservation, the facial features being remarkably intact; while the lotus ornament is still to be seen upon the breast, and the lower legs are in very fair condition. The remainder of the figure, however, is very much defaced through the shattering of the rock surface.

... isures of conservation I think that the only ... be to coat the better preserved surfaces with ... " leaving the remainder as at present It will further be desirable to close the open fissures in the rock surface with Portland cement, stained, in mixing, to the old tone of the weathered rock surface by the addition of a proportionate quantity of charcoal. Care will be taken to keep the pointing material slightly back from the rock surface, so that the image may not be disfigured with conspicuous streaks across the surface.

... supported an architectural canopy ... osition, while among the debris on ... n carved and wrought stones are to ... s upper feature I have therefore recommended that this debris be carefully cleared and sorted, and if any wrought, carved, or inscribed stones come to light they should be stacked in order near the image It will then be possible for an archæological officer subsequently visiting the place to decide whether a restoration of this canopy be at all feasible from the original material available

Jami masjid, Srinagar.

69. From June to the end of September, on special duty in Kāshmīr, I was engaged in assisting in the restoration of the famous old Jāmi' masjid at Śrīnagar, a notable example of the characteristic wooden architecture of this country. A considerable amount of preliminary work was involved in the way of preparing accurate drawing and photographic records of all the portions of the fabric that require to be dismantled and rebuilt.

Kashmir.

70. With the exception of the enclosing walls of the mosque, which are of brick, the whole construction is of wood—wooden columns (some are 50 feet high!), wooden roof construction, and, in the case of the high *dalans,* wooden walls, laid in blocks, as one would build with masonry. A great amount of all this woodwork has badly decayed and will require to be renewed; but while every endeavour is to be made to preserve the external appearance of the fabric, the crude and cumbersome methods of construction, which are to a very great extent responsible for the dilapidation of the structure, will necessarily be replaced with something more in consonance with present ideas of constructional efficiency.

71. There were a number of features interesting in the work. The brickwork of the enclosing walls, for instance, was found to be of two distinct varieties, the difference occurring about nine feet down from the lower *chajjā.* Above this level were the small *lakhauri* bricks, well burnt and with wide mortar joints; below, again, was an earlier, softer variety, approximating to a " rubber " brick in texture, larger in size and with finer mortar joints; the marked difference being indicative of two separate periods of construction. Another curious feature was in the construction of the low *dalan* roofs where they met, at right angles, at the corner of the building. The roof covering being of the characteristic birch-bark and earth, the necessity of avoiding any semblance of a definite mitre at the junction becomes very apparent, where any pronounced " valley " would result in the earth covering quickly being washed away in the rains. In the old work the planes of intersection were therefore manipulated to eliminate this mitre, as far as possible; and drawings have been made for this feature, so that it can be retained in the new repair.

72. A conservation note was drawn up for the guidance of the officers in charge of the work, and fifty-two large " measure drawings " prepared, together with fourteen photographs, which will be needed for reference in the reconstruction. A scheme for the treatment of the enclave with cypress-set approaches and grassed *parterres* was also prepared, with a view to rendering the precincts more appropriate and attractive than at present obtains.

Y. A. PAGE, A.R.T.B.A.

LIABILITY OF THE RAJA DHIRAJ OF SHAHPURA TO RENDER SERVICE TO THE SREE DARBAR OF UDAIPUR.

CONCLUDING NOTE OF THE SREE DARBAR.

THE controversy which has been raised by the Raja Dhiraj of Shahpura in respect of his liability to render service to the Sree Darbar of Udaipur on the present occasion has now been going on for some years. It commenced with a Representation made by him to the Political Agent of Harouti, which was forwarded by that officer to the Agent to the Governor-General, Rajputana, by a covering letter, dated 13th March 1895. The Sree Darbar then addressed a Kharita to His Excellency the Viceroy and Governor-General of India under the circumstances mentioned in the introduction of Part II of the book entitled "Replies to the Allegations of Shahpura," herewith submitted, appending to it translations of documents of the time of the present Raja Dhiraj and of his ancestors, and thereafter sent its Observations on Shahpura's Representation with a précis of documents to the Agent to the Governor-General, Rajputana; both the Kharita and the Observations showing that the Chiefs of Shahpura were bound to render service to the Sree Darbar like other feudatory Chiefs. In refutation of the statements contained in this Kharita, the Raja Dhiraj submitted a Memorandum to the Agent to the Governor-General and it then became necessary for the Sree Darbar to take notice of the allegations contained in the Memorandum and to show that those allegations are wholly incorrect.

2. For facility of reference the Sree Darbar has caused the allegations of Shahpura, as set forth in his original Representation, and the Sree Darbar's replies to them, to be printed in parallel columns in Part I; and the allegations of Shahpura as contained in his Memorandum and the replies of the Sree Darbar to these allegations in Part II of the book before referred to. These replies are based upon documents the authenticity of which is beyond doubt, and which the Sree Darbar has had carefully translated in English and printed in book form A copy of the book is also submitted herewith.

3. A perusal of the replies and the notes at foot of the documents will show how utterly untenable is the position which has been assumed by the Raja Dhiraj. They effectually deal with and scatter to the winds the arguments, so called, on which he relies. But as the replies are rather lengthy and the mode of argumentation resorted to by the Raja Dhiraj made it necessary that there

should be many repetitions in them, it has been thought advisable to summarize them and to present them in this note as concisely as possible in a connected form.

4. Before doing so, however, the Sree Darbar would once again, with the utmost respect, deprecate the intervention of the Paramount Power in this controversy. It is one which relates entirely to the internal administration of the Mewar State, and apart from treaties it has been the time-honoured principle of the British Government not to inter-meddle in any matter relating to such administration. It is quite true that the Shahpura Chief owes direct allegiance to His Majesty's Government in respect of a portion of his possessions, but as the Sree Darbar respectfully contends this fact does not affect his position as a Jagirdar of the Mewar State, and his allegiance to the Sree Darbar so far as the jagir which he holds under it is concerned is as absolute and complete as his allegiance to His Majesty's Government. In the year 1831, the then Commissioner of Ajmere, Sir Richard Cavendish, confiscated the jagir of Pargana Phulia, which was held by Shahpura under the Honourable East India Company for some fault committed by the then Chief. At his request, which was made to the Sree Darbar on the ground that he was a scion of the Sree Darbar, His Highness the then Maharana intervened in the matter of the confiscation and addressed a Kharita to Sir Richard Cavendish asking him to deal leniently with Shahpura. On receipt of this Kharita Sir Richard Cavendish wrote a reply to His Highness, dated 8th August 1831, in which he significantly states, "When your Highness's father, the late Maharana Sree Bhim Singhji Sahib Bahadur, confiscated the Shahpura jagir villages, the British Government made no recommendation in favour of the Raja." And he adds "It is simply foolish on the part of the Raja not to carry out the orders now passed by the British Government" (see document No. 30 in the book of Documentary Evidence). The plain meaning of this reply is that the Sree Darbar had no right to interfere in the dealings of the British Government with the Shahpura Chief, in the same way as the British Government had not and did not claim to have any right to interfere with the action of the Sree Darbar with Shahpura, so far as his jagirs under the Sree Darbar were concerned. In the time of Colonel Eden, who was Political Agent of Mewar in 1863 A.D., the Shahpura Chief was distinctly given to understand that the matters relating to chhatoond and service are strictly internal and outside the region where interference may be exercised by the political officers. As will appear from document No. 146, that officer expressly says: "I am unable to interfere in this matter as it relates to the question of chhatoond and service," and he further directed the Shahpura Chief to submit all his papers to the officers of Mewar and to have his matters settled by them. The Shahpura Chief solicits the interference of the British Government in this controversy on the ground, as the Sree Darbar understands it, that he is an independent Chief and that his

position is not that of an ordinary Jagirdar. That this is *not so will be evident* from document No. 31 in the book of Documentary Evidence, which is a petition *from the* then Raja Dhiraj to the then Maharana, and in which the Raja Dhiraj states: "It is your petitioner's belief that through your Highness's *kind* intervention everything will be decided favourably. Your petitioner, who is a chhoroo (child) of Your Highness, begs to state that anything good or evil happening to him shall *affect* your Highness." This is hardly the language of an independent Chief, and the action which the then Maharana took on this petition wholly negatives the claim of independent Chiefship set up by the Raja Dhiraj. It will be seen from document No 32 in the book of Documentary Evidence that the then Maharana sent a Kharita to His Excellency the Governor-General of India, in which he says that one of the reasons for which he is interested in the Chief of Shahpura is "because the Raja of Shahpura has since the time of the Moghul Emperors of India been a Chief (not *an independent Chief be it observed*) and one of the several vassals of mine" He also wrote to Mr. Martin, the then Nazim of Delhi, in which he asked that gentleman to introduce the Shahpura Chief to His Excellency and to *have his case settled favourably on the ground that "the Raja is one of my* vassals and has never done any act of disaffection against you or me" (see document No 33 in the book of Documentary Evidence). As will appear from documents Nos. 34 and 82 of the same book, His Highness's interference on this occasion was successful and the affairs of the Raja Dhiraj in connection with the British Government were amicably adjusted. But even supposing, for the sake of argument, that the Raja Dhiraj is an independent Chief, there are many instances in which not simply independent Chiefs, but even Kings holding fiefs under other Chiefs or Sovereigns, have had to render feudal service to their suzerain. To give one out of many instances in India, one may take the State of Morvi in Kathiawar, which is a first-class estate. This State holds the village of Umbadi in Cutch under a service tenure called *jiwai*, and its Prince is bound to render service to the Ruler of Cutch In the time of Colonel Tod the Chief of Shahpura having murdered the Chief of Amargarh was summoned to appear at Udaipur, and on his refusal to do so *his estate* in Mandalgarh was sequestrated, and Colonel Tod says (see Tod's Rajasthan, vol. 2, page 676, author's edition): "Kachhola forms the patta of Shahpura in this district, whose Chief has to serve two masters, *for he is a tributary to* Ajmere for Shahpura, itself a fief of Mewar, and holds an estate of about Rs 40,000 of annual rent in Mandalgarh, which has been two years under sequestration for his refusal to *attend the summons to* Udaipur and for his barbarous murder of the Chief of Amargarh This is a state of things which ought not to exist When we freed these countries from the Maharattas we should have renounced the petty tributes imposed upon the surrounding Chiefs not within the limits of the district of Ajmere, and the retention of which is the source of irritating

discussions with these Princes through the feudatories. Presuming on this external influence the Shahpura Raja set his sovereign's warrant at defiance and styled himself a subject of Ajmere nor was it until he found he was bound by a double tie of duty that he deigned to appear at the capital. The resumption of the estate in Mandalgarh alone overcame the inertness of the Chief of Shahpura. He has already too much in the Chowrasi or eighty-four townships of Shahpura, for such a subject as he is, who prefers a foreign master to his legitimate lord." In the time of Colonel Herbert, who was Political Agent in Mewar in 1876, the present Raja Dhiraj was given to understand by that officer that as he held the grant of Kachhola as jagir from the Sree Darbar, it was his duty to consider himself as a Sardar of Mewar and that his estate of Phulia stood on a different footing. And Colonel Herbert adds (see document No. 213 in the accompanying book of Documentary Evidence): "You should obey the orders of the Darbar like other Sardars of Mewar, and should not think that there is any degradation or loss of prestige to your estate in obeying them, because these two grants are quite distinct from each other." Again in the time of Colonel Bradford, who was Agent to the Governor-General in 1878, Major Cadell, then Political Agent of Mewar, in writing to the Sree Darbar on the strength, and with reference to a letter from Colonel Bradford, dated 3rd September 1878, says. "There has never been any doubt as to the relations between Mewar and Shahpura in regard to the Kachhola Pargana. They are as well known and defined as need be, being those of suzerain and feudatory, and of the same nature as those subsisting between Mewar and its other feudatories. It was on this footing that in 1872 the Agent to the Governor-General desired they might remain." (See document No. 219 in the accompanying book of Documentary Evidence.) Whether therefore the Chief of Shahpura is an independent Chief or not, he is a vassal of the Sree Darbar, and the relations between the two are strictly matters of internal administration of the Mewar State, and outside the region where interference on the part of the Paramount Power may legitimately be exercised.

5. If this controversy had not been one relating to the internal administration of the Mewar State, as from what has been stated above it is clear it is, the Sree Darbar would have had no fear of the result of the interference of the Paramount Power in it. The strength of the case of the Sree Darbar is so clear and the evidence on which it is based is so overwhelming and the Sree Darbar has such complete confidence in the sense of justice and fair dealing of the high-minded and large-hearted nobleman to whom is now entrusted the Supreme Rule of India, and who has by his statesmanship so endeared himself to prince and peasant alike, that the Sree Darbar would have willingly accepted and abided by His Excellency's arbitrament in the matter, but under the circumstances the Sree Darbar is unable to do so, for if he did he would stultify himself,

and his relations with his other Sardars would be seriously affected and his authority over them weakened to a degree While therefore the Sree Darbar respectfully ventures to maintain his independence of action as regards the Raja Dhiraj, he trusts that His Excellency, if the documentary evidence now submitted finds favour in his eyes, will be graciously pleased to inform the Raja Dhiraj that it is his duty to obey the commands of the Sree Darbar in accordance with the engagements made by his predecessors, which though attempts have from time to time been made on the part of the Raja Dhirajes to be put aside and treated as not binding on them, have always been upheld and are still in full force and virtue.

6 Throughout this controversy the Raja Dhiraj has lost sight of the fact that it was in olden times considered a high honour on the part of feudatory Chiefs to serve the Chief of their State. Their rank amongst themselves did not depend so much upon their wealth as upon the kind of service they were required to render. The more the service was in connection with the person of the Chief, the more the honour to the feudatory, and it was only Chiefs who were connected by blood or marriage with the head of the State who were thus honoured Jagirs were granted, and granted without monetary consideration, to enable the grantee to keep up his dignity and maintain his quota of troops in order that he might render effectual service to the head of the State. It was only when the head of the State was displeased with a feudatory that he dispensed with his services and such displeasure lowered the feudatory in the opinion of his fellows and in that of his own retainers and rayyats When therefore the Raja Dhiraj repeats in paragraph 3 of his Memorandum an allegation which he had advanced in his Representation that the then Sree Darbar "invited" Bharat Singhji, the grandson of Sujan Singhji, to Udaipur, "received him as an independent ruler and granted him an estate" of the value of Rs. 50,000, "without any term of service," he speaks in entire ignorance of the principles on which such estates are granted No independent ruler, if he was mindful of his independence and unwilling to render service, would accept such grant. The moment he did so he would, by the mere fact of his acceptance of the grant, become bound to render service to the grantor according to the latter's commands. (See page 2, Part I of the Book of Replies)

7. The Raja Dhiraj bases his non-liability to service on the ground—

(a) that as regards the villages which were granted to Maharaj Surajmal, the second son of Maharana Amar Singhji, there was no stipulation for service, and Maharaj Surajmal did not render any;

(b) that his ancestors were exempted from service in respect of other grants, because there was no stipulation for service in the grants, and also because 18 villages, which were promised to be restored, were

not restored, and a Khas Ruqa of Sambat 1879 (A.D. 1822) stipulated that so long as these 18 villages were not restored no service would be required.

8. It is not clear, taking the first ground first, why a grant for maintenance made by a Prince to his younger sons should be unlike other grants and be free from service. It is the duty of sons and brothers to help the head of their house, to keep up his dignity and to maintain his possessions. Does this duty lapse because the head of the family instead of giving them maintenance in the family makes over to them a part of his possessions? Isn't it clear, on the contrary, that the duty continues and the grant is made so that the junior members of the family may not only maintain themselves, but be in a position to render help to the head when help may be required of them? Is it not clear that a grant such as this carries with it the obligation to render service and that there is no difference between a jagir granted to a member of the family and one granted to a stranger? It appears to the Sree Darbar that on the face of it the first ground is wholly untenable and beyond his own *ipse dixit* the Raja Dhiraj has supplied no evidence whatsoever to show that this ground has any validity whatsoever as a matter of fact.

9. The Raja-Dhiraj has not in his statements taken into account the tenure on which these grants are held. He seems to have taken for granted that the grants inure in perpetuity for the benefit of the grantee and his heirs. But such is not the fact. These grants are resumable at will, and instances of such resumption are to be found in the book of Documentary Evidence. They lapse on the death of the grantee, or of the holder for the time being, and the ceremony of investiture with the sword and the recognition of the succession on the death of a holder, are intended as a confirmation of the grant on the part of the grantor or of his heirs. They also lapse on the death of the grantor or of his heir who has recognized and confirmed the grant, and the visits of the feudatories to the new occupant of the *gadi* of Udaipur and the nazaranas paid to him are intended to obtain from such new occupant a continuation of the grant. According to the law and custom obtained on this subject, no occupant of the *gadi* of any principality in India is entitled to alienate any portion of his possessions either in favour of the members of his family or others which would inure beyond his life-time, except under very exceptional circumstances, and such circumstances are not alleged to have existed in the case of any of the grants made by the Maharanas to the Chiefs of Shahpura. Mr. Mayne, in his treatise on Hindu Law and Usage, in paragraph 425 of the 5th edition of his work, says: "As a general rule property allotted for maintenance is resumable at the death of the grantee." "On the otherhand, there may be circumstances evidencing that a grant for maintenance was resumable at the pleasure of the grantor." That these

circumstances existed in connection with the grants to Shahpura will be apparent from the various instances to be found in the book of Documentary Evidence where grants were resumed at the mere will and pleasure of the Sree Darbar. (See particularly documents Nos. 13, 124, and 171.)

10. The other grounds consist of matters of fact and must depend for their validity on the evidence that may be produced in their support. A careful perusal of the documents relied on by the Raja Dhiraj will show that he has altogether failed to produce one *authentic document which* supports his allegations. On the other hand, the book of Documentary Evidence of the Sree Darbar shows conclusively that no jagir was ever granted to the Chiefs of Shahpura except on the express condition *that they should render* service to the Sree Darbar according to its commands And not only is that the case, but the Chiefs of *Shahpura have always admitted and acknowledged* their liability to render such service to the Sree Darbar. It also shows that whenever the Chiefs of Shahpura have failed to render such service or to obey the commands of the Sree Darbar, they have been punished and that their position is in no way different from that of the other feudatories of the Mewar State.

11 Before the Sambat year 1822 (A.D. 1765), various villages had from time to time been granted by the Sree Darbar to the Chiefs of Shahpura in jagir. But these had all been resumed, and for some time before and during a part of this year these villages were in the direct possession of the Sree Darbar. That the original grants were on condition of service will be evident from documents Nos 3, 4, and 5, which are all dated in Sambat 1807 (A D. 1751) But however that may be, in Sambat 1822 (A.D 1765), a fresh grant was made by the Sree Darbar to Raja Umed Singhji, who was then the Chief of Shahpura, of a large number of *villages yielding an annual income of* Rs. 1,24,200 And as will appear from document No. 6, this grant was on the express condition that Raja Umed Singhji should render service with 500 cavalry and 500 infantry in good condition. Raja Umed Singhji accepted this grant with the condition attached to it and in his letter acknowledging the grant (see *document No 7) he says, amongst other things* "Let God Sree Eklingji punish me if I ever fail to render service heart and soul in accordance with the orders of the Sree Darbar." "My previous faults have been pardoned by your Highness. If I am true to my God I myself will render some such service as will entitle me to come to pay my respects and to call myself a real Rajput. *All my honour* rests in your Highness's hands" If at that time the Chief of Shahpura had thought that the grant was without service, he would not have expressed himself in the way he did *And not only did he* so express himself, but he entered into an agreement with two sureties (see document No. 8) "to render service in accordance with His Highness's orders from which *there will be no departure*;" "to act like the other Sardars of Mewar

according to the orders of His Highness on all occasions, auspicious or inauspicious, in matters connected with the Dussera, etc.;" "to enjoy the jagir so long as service is rendered in obedience to the orders of His Highness." It must be remembered that in Sambat 1874 (A.D. 1818) various disturbances had occurred and the Chief of Shahpura having murdered the Chief of Amargarh, the entire jagir which had been granted to him or to his predecessor was resumed by the Sree Darbar, and in that year a Kaulnama was come to between the then Maharana and all the Chiefs—his feudatories, the 6th clause of which (see document No. 14 and Tod's Annals of Rajasthan, vol. I, page 210, author's edition) says: "According to command at home or abroad service must be performed. Four divisions shall be formed of the Chiefs, and each division shall remain three months in attendance at Court, when they shall be dismissed to their estates. Once a year on the festival of the Dussera, all the Chiefs shall assemble with their quotas ten days previous thereto, and twenty days subsequent they shall be dismissed to their estates." This Kaulnama has been in force all along and the Rajas of Shahpura have repeatedly assented to it. The Raja Dhiraj has endeavoured to show that the Kaulnama was not signed by any one having authority from his ancestor to do so. This endeavour, however, is futile. As will appear from document No. 28, the Sardars of Mewar in Sambat year 1887 (A.D. 1830) again gave their adhesion to this Kaulnama, and the document in question was signed on behalf of the Chief of Shahpura by his representative, Jowaharmal, who, as will appear from document No. 27, was deputed by that Chief to the Sree Darbar as his representative, and who, as will appear from document No. 39, continued to act as such representative until the Sambat year 1890 (A.D. 1834). Out of the villages which were resumed in Sambat year 1874 (A.D. 1818), those mentioned in document No. 16A., and yielding an annual profit of Rs. 58,700, were regranted to the Chief of Shahpura in the Sambat year 1878 (A.D. 1821), or after about three years. This grant says that the grantee will render service with sowar and foot, according to command of the Sree Darbar. It is true that the number of the foot and horse is not mentioned, but it is obvious that the grantee was bound to render service in accordance with the commands of the Sree Darbar. It will be seen from document No. 89 and the note appended to it that, under the circumstances mentioned in the note, the representatives of Shahpura in the Sambat year 1905 (A.D. 1849) promised that they would render service and pay chhatoond in proportion to the amount fixed in the time of Maharana Sree Jagat Singhji. There can therefore be no possible shadow of a doubt that the jagirs granted to Shahpura were on the express condition of the Chiefs rendering service to the Sree Darbar, and that the allegations of the Raja Dhiraj to the contrary are all baseless.

12. It has been stated above that the Chiefs of Shahpura have always acknowledged their liability to render service to the Sree Darbar according

to its command. In document No. 4, it will be seen that Raja Umed Singhji states: "We have no objection since we must serve wherever we are ordered by our master." "But if the order be that I must keep my troops there say for three or four months I shall then readily act according to the order." "I am ready in every way to obey the orders that his Highness may hereafter be pleased to dictate." "His Highness is the source of all my honour. My status has been exalted by him." In document No. 5 the same Raja says. "Notwithstanding all this, if His Highness be pleased to place my services under Dinanathji I have *not the slightest objection in obeying the order* of His Highness" "I should raise no objection even in serving any other insignificant man if it pleaseth His Highness." "All my honours depend upon the pleasure of our master." This was in the Sambat year 1807 (A.D. 1751). In the Sambat year 1874 (A. D. 1818) Raja Amar Singhji says (see document No. 11) "As soon as I am disengaged I will at once wait on your Highness." In the Sambat year 1884 (A.D. 1828) Raja Dhiraj Madho Singhji says: "I have made no default in service up to this time" (see document No. 24). The same Raja Dhiraj in the Sambat year 1901 (A.D. 1844) says (see document No. 75) "As I intend to pay homage to your Highness on the Dussera, my force will therefore come with me." "Our worth depends upon our service. As far as it lies in my power, I am willing to carry out your Highness's orders loyally" "Were it not for your Highness's favour, I would be turned out of Mewar" *Raja Dhiraj Jagat Singhji in the Sambat year 1905 (A.D. 1848) says* (see document No. 84): "It is my earnest desire to perform some such service as would meet with your Highness's approval." In the Sambat year 1916 (A D 1859) Raja Dhiraj Lachman Singhji (see document No 125) says: "Your Highness has passed an order to resume Kherar (jagir). Your Highness is my master. Why should your Highness pass such an order? It may be passed against one who disobeys your Highness's orders." In Sambat 1920 (A D 1864) the same Raja Dhiraj says (see document No 148): "We have since a long time past been obeying the orders of the Sree Darbar, and I am even now carrying out the orders of His Highness" In the Sambat year 1932 (A.D. 1875) the Foujdars and Kamdars of Shahpura writing to Colonel Herbert, Political Agent, Mewar, in their official letter, say (see document No. 208): "We have no objection * * * * to render service." *Not only did the Chiefs* of Shahpura acknowledge their liability to render service, but they actually rendered service on numerous occasions, as will appear from documents Nos 9, 17, 19, 20, 22, 26, 35, 37, 43, 44, 47, 53, 54, 57, 58, 64, 76, 88, 97, 101, 107, 134, 152, 158, 169, 180, 196, 197, 214, 216, 224, 225, 227, 228, 231, 235, 236, 239, 240 and 245.

The statement B, annexed to the book called "Replies to the Allegations of Shahpura," shows that from the Sambat year 1880 (A.D 1824) to the Sam-

bat year 1947 (A.D. 1891), the Raja Dhirajes presented themselves for service at Udaipur or in camps on 43 different occasions. Beside these actual attendances, the Chiefs, when they were unable, under circumstances over which they had no control, to attend to render service to the Sree Darbar, submitted petitions asking to be excused for their absence. The documents Nos. 25, 27, 36, 38, 63, 66, 70, 100, 111, 149, 151, 187, 188, 200, 206, 210, 223, 234, 242 and 244 are some of such petitions. Over and above these personal attendances, the Chiefs of Shahpura rendered service by sending their quota of troops, both horse and foot, to various places and for various purposes according to the orders of the Sree Darbar, as will be evident from documents Nos. 9, 29, 40, 45, 48, 49, 50, 51, 52, 61, 62, 63, 65, 68, 69, 70, 71, 72, 75, 85, 86, 87, 91, 92, 94, 96, 98, 106, 112, 113, 114, 115, 116, 117, 118, 119, 120, 122, 126, 133, 203 and 232.

On the face of all these facts it is idle on the part of the Raja Dhiraj to contend that there is no obligation on his part to render service to the Sree Darbar, and that if such obligation ever existed it ceased to exist at the express remission of the Sree Darbar, or by the Sree Darbar not having carried out its promise of returning the 18 villages before referred to.

13. That the Chiefs of Shahpura have been punished by the Sree Darbar on their failure to render service or obey its orders, and that there is no difference between them and the other feudatory Chiefs of Mewar will clearly appear from documents Nos. 13, 124 and 171, which show that on one occasion, *viz.*, in the Sambat year 1874 (A.D. 1818), the entire jagir was resumed, that on another occasion, *viz.*, in the Sambat year 1915 (A.D. 1859), an officer was sent to resume the jagir, because amongst other things the Shahpura Raja had "not been fully rendering the requisite service," and that in the Sambat year 1927 (A.D. 1871) the entire jagir of Kachhola in Mewar was confiscated, because the Raja Dhiraj had left the camp at Badnore without leave and gone home. The confiscation in A.D. 1859 was not actually carried out, because the Raja Dhiraj submitted unreservedly to the orders of the Sree Darbar, as will appear from document No. 125 already referred to. Besides confiscating the entire jagir, partial confiscation of villages was from time to time made, as will appear from documents Nos. 21, 93, 144, 155, 156, 157, 165 and 172. And fines were sometimes imposed, as will appear from documents Nos. 90 and 177. Dhonses were sent for attachment, as will appear from documents Nos. 123, 145, 156 and 157. And on the demise of the Chiefs of Shahpura the whole jagir is for a time sequestrated, so as to show that, as is before stated, the jagir is held by them at the will of the Sree Darbar and not by any other right (see documents Nos. 79 and 105). As regards the fact that the Chiefs of Shahpura have been treated like the other feudatory Chiefs of Mewar, the documents are numerous and it is unnecessary to refer to more than a few of them relating to the subject. They are documents Nos. 90, 102, 107, 123, 127, 128, 129, 134,

160, 163, 164, 178, 181, 182, 184, 185, 198 and 202. It will be seen from document No. 102 that in the Sam bat year 1908 (A.D. 1852) some question was raised with regard to the rights and privileges of the Raja Dhiraj; and it having been referred to the Sree Darbar, a full list of these rights and privileges was ordered to be prepared, and accordingly the document No. 102 was prepared and a perusal of this document with its note will show how dependent the Raja Dhiraj is on the Sree Darbar for his honour and what duties he was to perform when serving the Sree Darbar.

14. In paragraph 8 of his Memorandum the Raja Dhiraj alleges that "a clear stipulation was entered in a Khas Ruqa of Sambat 1879 (A.D. 1822), containing that the Raja Dhiraj shall not be called for service so long as the remaining 18 villages, including Agoocha, are not restored to him " He evidently refers to the Khas Ruqa which is Appendix No. 20 to his Representation. This matter has been dealt with in pages 25-29 of Part I of the book of "Replies to the Allegations of Shahpura." The Khas Ruqa in question is dated *Sawan vid* 8 Sambat 1879 (July 12th, 1822, A.D.). It appears from the Mewar State diary *of Sambat 1880-81 (A.D. 1824) that on Chait sud 8 Sambat 1880 (A.D. 1823)*, Raja Amar Singhji presented himself at Udaipur to render service to the Sree Darbar *and remained up to Sawan sud 10 Sambat 1881, i.e.*, remained for four months (see document No. 17). If he was exempted from service on Sawan vid 8 Sambat *1679*, it is, to say the least of it, rather singular that he should have presented himself for service at Udaipur on Chait sud 8 Sambat 1880. At this time the Sree Darbar was much pleased with the services of the Chief of Shahpura and it was therefore that on Sawan vid 14 Sambat 1881, *i.e.*, about 11 days before his departure from Udaipur on the occasion, the Sree Darbar conferred the title of Raja Dhiraj on the Chiefs of Shahpura, stating in the Sanad (see document No. 18): "It gives us great pleasure to confer on you the title of Raja Dhiraj, and be assured that we will continue to address you so from generation to generation without fail." And the Chiefs of Shahpura have since been so honoured. As has been before pointed out, the Chiefs of Shahpura have on numerous occasions personally attended at Udaipur to render service after the so-called exemption. And these facts are sufficient to show what value is to be attached to the allegation which the Rãja Dhiraj has made in connection with this appendix No. 20.

15. It may not be out of place to consider here "the list of visits paid by the Raja Dhiraj during the last 50 years, from Sambat 1902 to Sambat 1951," as mentioned in appendix B. to the Raja Dhiraj's Memorandum It will be observed that though the Raj Dhiraj prefers to commence from Sambat 1902, he in fact commences from Sambat 1857, and gives the number of visits paid by Raja Dhiraj Amar Singhji to Udaipur from Sambat 1857 as four, whereas, as

will appear from documents Nos. 17, 19, 20 and 22 he personally paid three visits between 1880 and 1884, being a period of five years only, and once sent his son to render service to the Sree Darbar. The State diary of Mewar up to Sambat 1880 shows that besides the attendances above referred to, he attended on other occasions (see document No. 9). Raja Dhiraj Amar Singhji was succeeded by his son, Raja Dhiraj Madho Singhji, and he occupied the *gadi* of Shahpura for a period of about 18 years. During this period he personally presented himself for service 12 times (see documents Nos. 26, 35, 37, 43, 44, 47, 53, 54, 57, 58, 64 and 76) and sent 7 excuses (see documents Nos. 25, 27, 36, 38, 63, 66 and 70). In appendix B. to the Raja Dhiraj's Memorandum these visits are alleged to have numbered only 5, and not one of these 5 visits was, according to the Raja Dhiraj, for rendering service, although in the first petition which he submitted to the Sree Darbar after ascending the *gadi* he says (see document No. 24 before referred to): "I have made no default in service up to this time." In another petition presented by him in Sambat 1887 (see document No. 27) he says, referring to an order from the Sree Darbar: "Your petitioner has been required to wait upon your Highness during the Dussera festival. Your petitioner begs to state that he would have undoubtedly presented himself on that occasion, but your petitioner was prevented from doing so as a motsudhi officer, on behalf of the Ajmere officials, has come to your petitioner's place and stopped the payment of custom duties to your petitioner." Raja Dhiraj Madho Singhji's last attendance at Udaipur was during the Dussera festival of the year before his death, which took place in the month of Asoj Sambat 1902 (A.D. 1845). Raja Dhiraj Madho Singhji presented himself for service on 12 different occasions, besides excuses on other occasions, and yet the present Raja Dhiraj alleges that he only paid 5 visits, and these not to render service, but on other business. All that the Sree Darbar can say with reference to this allegation is that it is audacious—audacious in the extreme. Raja Dhiraj Madho Singhji was succeeded by his son, Raja Dhiraj Jagat Singhji, then a minor. In appendix B. to the Raja Dhiraj's Memorandum it is alleged that he went to Udaipur only twice, once to be invested with the sword and once again to settle some dispute about some ceremonies. The information on which this allegation is based is wholly incorrect, for it will appear from document No. 84 that after his accession, in Sambat 1904 Raja Dhiraj Jagat Singhji sent his quota of troops under his representative to render service to the Sree Darbar, which served for eight months, going away in the month of Bhadwa Sambat 1905 and, as will appear from document No. 88, he himself came in Sambat 1905 to render service and to be invested with the sword, which ceremony took place on Jaith sud 5 Sambat 1905. On Pous sud 12 Sambat 1907 he joined the Sree Darbar's Camp while on tour at Mandalgarh (see document No. 97). And he came again to Udaipur to render service to the Sree Darbar on Fagan sud 3 Sambat 1908 (see document

No. 101). It was while at Udaipur on this occasion that the list of the rights and privileges of the Raja Dhiraj of Shahpura *claimed on his behalf* was submitted by document No. 102 before referred to. The last paragraph *but three of this document* may be usefully reproduced here. "The above is the list of the privileges. His Highness may enforce the observance of such privileges as may be conferred by him, we shall act according to orders These have been submitted by us. His Highness has conferred what pleased him. We hope His Highness will grant other privileges that may hereafter be applied for." Raja Dhiraj Jagat Singhji attained his majority in Sambat 1904 (A.D. 1848), and he occupied the *gadi* until his death, which took place on Asoj vid 6 Sambat 1910, *viz., for about 6 years, and during that time* he rendered service on 3 occasions personally and once sent his whole quota of troops under his representative to render service to the Sree Darbar, and his troops did other service also, as will appear from documents Nos 94, 95, 96, 98 and 99. Raja Dhiraj Jagat Singhji was succeeded by Raja Dhiraj Lachman Singhji, who occupied the *gadi* of Shahpura down to Kartic sud 3 Sambat 1926 (A D. 1869), when he died. In appendix B. to his Memorandum the Raja Dhiraj alleges that Raja Dhiraj Lachman Singhji only came to Udaipur 4 times, and *that his visits were not for* service, but for other purposes. Here also the information on which this allegation is based is incorrect, for as a matter of fact, as will appear from documents Nos. 107, 108, 134, 152 and 158, Raja Dhiraj Lachman Singhji came to Udaipur 4 times and each time for service, and once sent his whole quota of troops to Udaipur to render service to the Sree Darbar and, as will appear from documents Nos 111, 149 and 151, on 3 other occasions he sent excuses for his non attendance. As will appear from document No 107, his first visit was paid on Fagan sud 10 Sambat 1911 (A.D. 1855) and he was then invested with the sword And *considering that he is said to have been a boy of 12 at the time of his accession,* which took place in A.D. 1853, it cannot be said that there was any unusual delay in his presenting himself at Udaipur. The document No. *107*, before referred to, records that Raja Dhiraj Lachman Singhji presented himself at Udaipur to render service and was invested with the sword, and Rs. 5,000 were paid by him for nazarana. The Raja Dhiraj says he came to be invested with the sword only But even if he did so, the journey to Udaipur for the sword ceremony is in accordance with ancient custom a sign of servitude, an admission that his accession must be recognized by his suzerain, and that until such recognition he could not enjoy his *jagir under the* Mewar State In the next year, Sambat 1912, Raja Dhiraj Lachman Singhji sent his whole quota of troops to Udaipur under his representative to render service to the Sree *Darbar (see document* No. 108). Shortly after this date the Indian Mutiny broke out, and as Shahpura was invested by the mutineers, the Raja Dhiraj was unable to come to Udaipur for some time. He, however, under the orders of the Sree Darbar, rendered, along with the other feudatory Chiefs of the State, various services to

the Sree Darbar in its aid to the Honourable East India Company during the time of mutiny (see note on document No. 135). It is alleged in appendix B. to the Raja Dhiraj's Memorandum that Raja Dhiraj Lachman Singhji went to Udaipur for the third time for an equitable settlement of 3 disputes pending between him and the Sree Darbar, *viz.*, his claim for the recovery of his investiture fee, alleged to have been illegally realized by the Sree Darbar, his claim for a lac of rupees on account of Mehta Ram Singh, and the demand of the Sree Darbar for service and chhatoond according to a Kaulnama (agreement) signed by other Sardars of Mewar. And the date of this visit is said to be Jaith vid 8 Sambat 1921 (A.D. 1865). This allegation is not correct. For at this time there was no question of the Darbar's demand for service or chhatoond unsettled between him and the Sree Darbar. Shortly after his arrival at Udaipur on the occasion of his second visit, which took place on Pous vid 9 Sambat 1918 (A.D. 1861), Raja Dhiraj Lachman Singhji raised the question of his liability to render service to the Sree Darbar, and it so happened that the then Deputy Commissioner of Ajmere wrote a letter, dated January 10th, 1862 (see document No. 135), to the Political Agent, Mewar, asking for leave for the Raja Dhiraj to go back to Shahpura, as being involved in debt his stay at Udaipur for a long time would increase his expenses and debts. A copy of this letter was sent to the Prime Minister of Mewar by the Political Agent and he required to know under what privilege and practice the Raja Dhiraj was required to remain in attendance on the Darbar for service, and whether the presence of the Raja Dhiraj at Udaipur was then deemed necessary or not. The Prime Minister replied to the letter detailing all the liabilities of the Raja Dhiraj (see document No. 136) and a copy of this reply was sent by the Political Agent to the Foujdars and Kamdars of Shahpura, and they were required to let him know in reply whether the statements made by the Prime Minister in his letter were correct or not (see document No. 137). Chand Mall, one of the Kamdars of Shahpura, replied to the Political Agent in effect setting up the case now made by the Raja Dhiraj (see document No. 138). The matter was then investigated, and as will appear from documents Nos. 135, 136, 137, 138, 139, 140, 141 and 142, the claims of Shahpura were rejected and the Political Agent, Mewar, directed that in case the Raja Dhiraj should fail to produce General Lawrence's letter, he should have to render the 3 months' service every year as is done by the other Sardars. The letter from General Lawrence above referred to, and which the Raja Dhiraj did not produce at that time, has now been produced, by the present Raja Dhiraj, and is numbered 30 in the appendix to his Representation. But as the Raja Dhiraj well knows, General Lawrence himself cancelled this letter on objection being taken to it by the Sree Darbar (see documents Nos. 109 and 110). The foregoing facts show that in the Sambat year 1921 (A.D. 1865) no question was unsettled between the Sree Darbar and the Raja Dhiraj as regards his liability to attend at Udaipur and render

service. As will appear from documents Nos. 142, 143, 145 and 146, in Sambat 1921 some difference in amount with regard to chhatoond had been pointed out by Raja Dhiraj Lachman Singhji, but this can hardly be dignified by the name question, but even this had been set at rest in that year. And, as will appear from document No. 150, Colonel Eden, then Political Agent, Mewar, expressly told the Raja Dhiraj that it was in his opinion necessary that the Raja Dhiraj should go to Udaipur "for rendering the requisite service and for settling the account with the Sree Darbar." And yet the Raja Dhiraj alleges in his Memorandum that 3 questions were unsettled and that his immediate predecessor went to Udaipur in that year to settle them. In Sambat 1924 (A.D 1867) Raja Dhiraj Lachman Singhji again presented himself at Udaipur to render *service to the Sree Darbar* on the Dussera (see document No. 158) and, as will appear from document No 159, he fell ill in Sambat 1925 (A.D. 1868) and died in Sambat 1926 (A.D. 1869), being succeeded in the *gadi* by the present Raja Dhiraj, who was adopted into the family after his predecessor's death.

16. The Raja Dhiraj's *first act after his succession was to inform* the Sree Darbar that he was about to be married and to solicit the gift of a shiropa or full head dress and other things for that auspicious occasion as is customary (see document No. 164). This gift is considered as a mark of honour shown by the Sree Darbar to the Chiefs of Shahpura and is eagerly sought by them. For the omission of this gift would be considered as showing that the Sree Darbar was displeased with the Raja Dhiraj. Soon after this he submitted a petition stating "I have been anxious to wait on your Highness and I shall soon do so" (see document No. 165). The Raja Dhiraj in the appendix B. to his Memorandum says he has attended 9 times in all since his accession to the *gadi* and is careful to show that not one of these attendances was for the purpose of rendering service. Yet he is willing to agree to pay visits to render service once in 12 years according to the average deduced by him. If, as he alleges, he is not bound to render service, why *should he pay any visits at all?* *The fact of* the matter is that he knows full well that he is bound, as his ancestors before *him were bound, to render* service to the Sree Darbar like other Sardars of Mewar, and is now endeavouring to escape from his liability by resorting to all sorts of excuses—excuses which are all bad and untenable. The reasons which he gives for the visits he says he paid are no reasons at all and are not worth a moment's consideration. From the time of his succession to the time when this controversy was begun by him he personally attended on the Sree Darbar on 16 occasions (see documents Nos 169, 180, 196, 197, 214, 216, 224, 225, 227, 228, 231, 235, 236, 239, 240 and 245), sent his quota of troops under his representative to render *service to the Sree Darbar* on 2 occasions (see documents Nos. 212 and 215), and sent 9 excuses for his *non-attendance* (see documents Nos. 187, 188, 200, 206, 210, 223, 234, 242 and 244). All these

attendances were for rendering service, mostly at Udaipur and sometimes at camps. It is not possible to go through the documents of his time without coming to the conclusion that the case now set up by him is not a true one, and however harsh it may sound, he knows that it is not a true one. For the documents are all of his own time and he must be quite cognizant of them.

17. From 1823 A.D. to 1891 is a period of 68 years, and taking the excuses as tantamount to attendances, there were altogether paid by the Raja Dhirajes of Shahpura 62 visits to Udaipur and camps for the purpose of rendering service to the Sree Darbar, and the average to be arrived at is not one attendance in 12 years, but one in a year and few months. But the Raja Dhiraj is so bent on carrying his point that he will not see facts that are obvious, will not consider propositions that are self-evident. The Sree Darbar's right to demand the performance of his duty and obligations by the Raja Dhiraj is not dependent upon the number of times the Raja Dhirajes rendered services to him or to his predecessors. They were bound, if summoned, to come to Udaipur to render service every year, and the fact, if fact it be, that they did not, cannot justly be pleaded in derogation of the Sree Darbar's right. The argument based upon the average of attendances is, therefore, fallacious, but even here the Raja Dhiraj's arguments are founded upon miscalculation and, may it not be said, misrepresentation.

18. A few more of the documents in the book of Documentary Evidence may be usefully summarized here to show the exact position which the Raja Dhiraj of Shahpura holds in subordination to the Sree Darbar and the services which he has rendered in the past and is bound to render in the future. It has been pointed out already that on the occasion of his wedding he solicited a gift of the customary shiropa from the Sree Darbar. In a petition from the Foujdars and Kamdars of Shahpura, dated Pous sud 15 Sambat 1928 (A.D. 1872), to the Sree Darbar, it is said that it is customary for the Raja Dhiraj to obtain the gift of an elephant at the time of the investiture of the sword. And it is pointed out that at the last ceremony no elephant had been given and a State elephant which was in use at Shahpura at the time was asked to be given to the Raja Dhiraj (see document No. 182). At this request the elephant was presented to the Raja Dhiraj. By a petition dated Fagan sud 15 Sambat 1928 (A.D. 1872), submitted by the Raja Dhiraj to the Sree Darbar, he informed the Sree Darbar that the marriage of his aunt had been arranged to take place with the Maharaj Kumar of Jodhpur, and he requested that the customary gifts may be made on the occasion (see document No. 184). On Kartic sud 12 Sambat 1928 (A.D. 1871) his investiture with the sword took place, and on that occasion he presented to the Sree Darbar the customary nazaranas, for the grant of the jagir, for the gift of the title of Raja Dhiraj, and for various

privileges (see document No. 181). On other occasions he paid other *nazaranas* as is customary. The amounts paid are no doubt small, but their importance lies not in their value, but in their showing that the Raja Dhiraj recognized and submitted to his vassalage to the Sree Darbar. Soon after the death of Raja Dhiraj Lachman Singhji and before the adoption of the present Raja Dhiraj, an enquiry was made by the then Political Agent of Mewar as to the rights of the Sree Darbar over Shahpura and in reply to this enquiry the document No. 160 was submitted to him. This document shows clearly the rights of the Sree Darbar over Shahpura. The present Raja Dhiraj was aware of the rights of the Sree Darbar over Shahpura at the time of his succession. Indeed he would not have been selected to succeed to the *gadi* of Shahpura if it had not been for the fact that the Sree Darbar consented to and approved of his being selected. The Raja Dhiraj not only did not on his succession take any exception to the rights of the Sree Darbar over him, as shown in document No 160, but acted in accordance with them for years, and now it seems that he finds his position so irksome that he wishes to resile from it by means which cannot be commended either for accuracy or for candour. Again in May 1872 the then Political Agent of Mewar sent certain written enquiries with regard to Shahpura's relationship to the Sree Darbar, and in reply the Sree Darbar in effect reiterated the position as given in document No. 160 (see document No 185). From document No. 168 it will be seen that the Raja Dhiraj was ordered to accompany the Sree Darbar to Ajmere like other Sardars on the occasion of a visit that His Excellency the Viceroy intended to pay to that place on 20th October 1870. And the Raja Dhiraj after demurring not to the order, but to the small number of followers he was asked to take with him, joined the Sree Darbar. On the return journey he left the camp of the Sree Darbar without leave and for this offence his whole jagir of Kachhola in Mewar was confiscated. He asked pardon for his offence and paid a fine of Rs. 13,000, which was inflicted on him, and on such payment the jagir was again restored to him (see documents Nos. 176, 177 and 178). In 1872 the Raja Dhiraj got into trouble with the officers of the Paramount Power and he, like his predecessor Raja Dhiraj Madho Singhji, sought the good offices of the Sree Darbar on his behalf. In his petition to the Sree Darbar in connection with this matter, which is document No. 183, he says, amongst other things, that "At the time of my installation your Highness gave me full authority over my estate and afterwards the Agent to the Governor-General, Rajputana, also coming over here presented me a robe of honour and read before me the letter of authority. Now that without any fault on my part an officer is appointed to manage my affairs I pray your Highness to be pleased to take means to prevent the present course from being adopted." It will be seen from document No. 190 that the Raja Dhiraj sent a petition to the Sree Darbar in Sambat 1930 (A.D. 1873) for leave of absence from attending the Dussera of that year. This leave was not

granted and he sought the protection of the Political Agent, Harouti, but as will appear from documents Nos. 191, 192, 193, 194 and 195, he did not receive any encouragement from the Political Officers, and the Sree Darbar having insisted upon its right, that the Raja Dhiraj should attend, he presented himself for service at Udaipur on Migsar sud 8 Sambat 1930 (A.D. 1873) and served for a period of 3 months and 12 days. At the expiration of this time he got leave to depart and did so (see document No. 196).

19. The Raja Dhiraj, in his Memorandum, reiterates his assertion that his predecessors were exempted from attendance and service and relies on the documents he originally put forward. It will take too long to deal with them here, nor is it necessary that this should be done, regard being had to the fact that the book of Replies to the Allegations of Shahpura, and the notes at foot of the documents in the book of Documentary Evidence, have fully disposed of them. The Sree Darbar confidently leaves the true interpretation of the documents on which he relies to the impartial reader, and has no doubt that the specious reasoning and uncandid statements contained in the Raja Dhiraj's Memorandum will be obvious to him. Can there be any doubt as to the meaning of the documents to which attention has been called in this note? Do they show that the Raja Dhiraj is exempt from rendering service? Do they in the least degree support his case? No. Most of these documents are of the time of the present Raja Dhiraj himself, the majority of them were written either by him personally or by his agents under his direction, and yet on the face of them the Raja Dhiraj has the temerity to say that he is not bound to render service to the Sree Darbar.

20. The Raja Dhiraj harps in his Memorandum on the alleged fact that he only holds villages producing an income of Rs. 35,000 per annum, whereas it has been asserted on the part of the Sree Darbar that his income from his Mewar villages amounts to about Rs. 1,20,000 per annum. The question is one of fact, and can only be decided upon an investigation on the spot or from papers which are in the possession of the Raja Dhiraj, but which he has not produced. It is however difficult to see what relevancy this question has to the main question raised by the Raja Dhiraj, *viz.*, his liability to render service to the Sree Darbar. If the Raja Dhiraj was exempted from rendering service, or if he never was bound to render service and never did so, does it matter whether the jagir he holds under the Sree Darbar is worth Rs. 35,000 or Rs. 1,20,000 per annum? If by virtue of his being a Jagirdar he is bound to render service to the Sree Darbar, does it matter whether the jagir is worth Rs. 100 or a lac of rupees a year? Unless it be the Raja Dhiraj's contention that the lesser the income the lesser the service, or the larger the income the larger the service; which is not. The income of the jagir could only have been introduced for the purpose of obscuring the point at issue. On the main question, the evidence

is all one way and it is confidently asserted *that it shows that*, as before stated, the contention of the Raja Dhiraj is wholly unfounded and his reasoning in support of it is unsound and based not upon facts, but upon imagination. The Raja Dhiraj is not bound to hold on to his jagir under the Sree Darbar. If the *rendering of service* to the Sree Darbar is so irksome to him, his remedy is in his own hands. All *he has to do is to surrender his jagir* and cut off all connection with the Sree Darbar. But he does not seem willing to do so. He is endeavouring to occupy two wholly inconsistent positions. First he wishes to derive all the benefit he can from the jagirs, and secondly he does not wish to burden *himself with* the obligations of a Jagirdar. He cannot be allowed to *do so He must elect whether he* will keep the jagir *and* render service, or give up the jagir and be free from all other obligations *of service*

21. The Raja Dhiraj has *raised some question* as *to Parwanas issued from* Udaipur and Khas Ruqas. He seems to think *that the former are not worthy* to be obeyed by him. This subject is fully dealt with at page 50, Part I, of the book of Replies to the Allegations *of* Shahpura and need not occupy much attention here. A reference to documents Nos. 66, 70, 74 and 100 will show that the Raja *Dhirajes have considered Parwanas* just as efficacious and binding as Khas Ruqas. The *only difference* between them is that Khas Ruqas are private letters issued by the Sree Darbar and the Parwanas are official letters, but as is well known to the Raja Dhiraj, both the Parwanas and the Khas Ruqas are the orders of the Sree Darbar

22. In conclusion the Sree Darbar asserts—and asserts most emphatically—that he is anxious to live *in peace* and *amity* with *all* his subjects, and particularly with those *who are his* feudatories. He has always *granted to them the privileges that are their due, shown* them whatever *honour* is *their* due. So long as his feudatories duly discharge their obligations they are under to him, they will find in him an indulgent *Chief,* a gentle taskmaster, a forgiving friend. The Raja Dhiraj of Shahpura has now for the last nine years evaded the fulfilment of *his obligations to the Sree Darbar by raising this controversy He has* under *its mask thwarted* and set at naught his authority If this had been the first occasion that this controversy is raised, there might have been some excuse for him, but this is not the first nor the second nor yet the third time that it has been raised. Whenever raised before it was decided against the Raja Dhiraj. And the Sree Darbar who *has not endeavoured to impose any new liabilities on the Raja Dhiraj,* but *only to get the old state of things continued,* feels bound to say that the Raja Dhiraj's conduct is wholly unjustifiable and that he ought to receive no countenance whatsoever in his controversy with the Sree Darbar from the Paramount Power

RAJPUTANA PROVINCE.

PUBLIC WORKS DEPARTMENT.

IRRIGATION BRANCH.

Chief Commissioner's *Review of the* Revenue Report on Irrigation Works in Ajmer-Merwara for the year 1928-29.

No. 374 S. of 1930,

Dated Mount Abu, the 13th May 1930.

READ

Letter No. 830, dated the 17th January 1930, from the Commissioner, Ajmer-Merwara, forwarding the Revenue Report on Irrigation Works in Ajmer-Merwara for the year 1928-29 together with the usual appendices.

OBSERVATIONS.

1. The average rainfall during the year was 22 inches and 85 cents as against 29 inches and 8 cents in the previous year and a normal of 21 inches.

2 From the irrigation point of view the year under report was satisfactory. The total gross revenue assessed for the year amounted to Rs. 1,37,877, as compared with Rs. 1,35,804 for 1927-28.

The financial results of the year are tabulated below:—

Sub-Collectorate	Total Capital outlay including Direct Charges		Gross Revenue Collections.			Working Expenses			Net Revenue	Percentage of net revenue on capital at end of 1928 29
	During the year	To end of the year	Irrigation Revenue	Miscellaneous receipts	Total	Direct	Indirect.	Total.		
	Rs	Rs	Rs	Rs	Rs	Rs	Rs	Rs	Rs	
Ajmer	...	18,61,805	60,615	2,987	63,602	25,261	211	25,472	38,130	2 05
Beawar	.	11,94,229	54,032	2,798	56,830	28,700	194	28,894	27,936	2 34
Todgarh		4,91,899	26 145	340	26,485	19,527	137	19,664	6,821	1 39
Total for 1928-29	.	35,47,933	1,40,792	6,125	1,46,917	73,488	542	74 030	72,887	2 06
Total for 1927-28	.	35 47,933	1,30,217	7,030	1,37,247	80,561	562	81,123	56,119	1 58

Two diagrams of financial and working records are attached.

3. The following table compares the Irrigation Revenue assessed for the year 1928-1929 with the area irrigated and protected:—

Sub Collectorate.	Irrigation Revenue assessed.	Area in Acres.			Assessment per acre.
		Irrigated.	Protected.	Total.	
	Rs.				Rs.
Ajmer	56,784	11,826	3,195	15,021	3·78
Beawar	48,757	9,556	3,611	13,167	3 70
Todgarh	26,210	3,902	607	4,509	5·81
Total for 1928-29	1,31,751	25,284	7,413	32,697	4 03
Total for 1927 28	1,28,775	23,668	7,774	31,442	4·09

B

The irrigation revenue assessed includes all assessments due to protected as well as irrigated areas and also the fixed yearly assessment of—

(*a*) Rs. 35,798 on crops irrigated from wells, and

(*b*) Rs. 7,395 on account of difference between dry and wet rates.

Of the area irrigated, 11,132 acres were cultivated under Kharif and 14,152 acres under Rabi, as compared with 5,578 and 18,090 acres respectively in 1927-28.

No remissions were made during the year under report.

The outstandings of revenue demand at the end of 1928-29 aggregated Rs. 53,980.

4. The working expenses were distributed as follows :—

Working expenses.	1927-28.	1928-29.	Difference Increase (+) Decrease (—).
Extensions and improvements and maintenance	56,220	54,245	—1,975
Establishment	25,979	24,226	—1,753
Tools and Plant	1,350	1,293	—57
Sundries (Suspense)	—2,883	—6,276	—3,393
Audit and Accounts Establishment	562	542	—20
Total	81,128	74,030	7,098

The working expenses per acre irrigated and protected fell from 2·58 in 1927-28 to Rs. 2·26 in 1928-29, due to less expenditure incurred on the maintenance and repairs of tanks.

5. The value of crops raised on 32,697 acres during the year 1928-29 was estimated at Rs. 14,84,080. The principal crops were Wheat, Barley, Maize, Mixed Grains and Cotton, and their estimated values were 1,28,999, 2,83,322, 2,42,429, 1,59,768 and 5,52,380 respectively.

6. During the year experiments were made to ascertain the outturn of Barley in the Beawar Tahsil. The results are shown in statement No. VI prescribed under Rule 49 of the Irrigation Rules.

Ordered.—That this review together with the papers read in the preamble be printed, and 12 copies furnished to the Government of India under a covering letter and 2 advance copies each to the Public Works and Revenue and Statistics Departments of the India Office.

L. B. SPILSBURY,

Secretary to the Hon'ble the Chief Commissioner,
Ajmer-Merwara, in the Public Works Department.

The 8th March 1930.

Annual Report on the Irrigation Works of Ajmer-Merwara District for the year ending on the 31st March 1929.

I. *Rainfall.*— The average rainfall during the year 1928-29 was 22 inches and 85 cents as compared with 29 inches and 8 cents in the preceding year, the normal being 21 inches. The year under report comprises Rabi 1335 and Kharif 1336 Fasli. The outturn was good throughout.

II. *Classification of tanks.*—There was no alteration in the classification of the tanks.

III. The amount of capital outlay remained unchanged, *viz.*, Rs. 35,47,933. No capital expenditure was incurred during the year under report.

IV. The gross revenue assessed during the year amounted to Rs. 1,37,877, as under:—

	Rs.
Ajmer	59,742
Merwara	78,022
Public Works Department	113
	1,37,877

The figures of the preceding five years were as shown below:—

	Rs
1928-29	1,37,877
1927-28	1,35,804
1926-27	1,32,527
1925-26	83,929
1924-25	1,09,317
1923-24	93,790

The subjoined table compares the assessment under report with that of the preceding year for the different classes of tanks:—

Classes of Tanks.	1927-28.			1928-29.			Difference between the figures of 1927-28 and 1928-29.
	Ajmer.	Merwara.	Total.	Ajmer	Merwara.	Total.	
Crop Rate Tanks	5,105	14,673	19,778	5,157	15,116	20,273	+495
Variably assessed and fixed Tanks.	34,709	31,095	65,804	35,651	32,634	68,285	+2,481
Share of well assessment and difference between wet and dry rates.	15,976	27,217	43,193	15,976	27,217	43,193	...
Miscellaneous	4,528	1,896	6,424	2,958	3,055	6,013	—411
TOTAL	60,318	74,881	1,35,199	59,742	78,022	1,37,764	+2,565
Add—Amount realised by the Public Works Department.	242	363	605	29	84	113	—492
GRAND TOTAL	60,560	75,244	1,35,804	59,771	78,106	1,37,877	+2,073

V. The total area assessed for both the harvests amounted to 32,697¼ acres as compared with 31,441¾ acres last year.

The area assessed is compared below with the preceding five years' figures :—

Years.	Acres.
1928-29	32,697¼
1927-28	31,441¾
1926-27	31,340¾
1925-26	11,079¾
1924-25	26,706
1923-24	16,880¼

The comparison between the figures of Kharif and Rabi cultivation for the two previous years and those of the year under report is as follows:—

Year.	Kharif.	Rabi.	Total.
	Acres.	Acres.	Acres.
1928-29	[illegible]	[illegible]	32,697¼
1927-28	[illegible]	[illegible]	31,441¾
1926-27	[illegible]	[illegible]	[illegible]

VI. The subjoined table shows the figures of demand, collection and balance for the year under report as compared with those of the previous five years:—

District and Tahsil.	Demand.				Collections for the year.					Actual collections.
	Assessment of the year.	Outstanding at end of last year.		Total demand.	[illegible]	[illegible]	[illegible]	[illegible]	Total.	
		Total at the end of the year.	Not due at the end of the year.							
1	2	3	4	5	6	7	8	9	10	11
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Ajmer . . .	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	—	[illegible]	[illegible]
Beawar . . .	[illegible]	—	[illegible]	[illegible]	—	[illegible]	—	—	[illegible]	[illegible]
Todgarh . . .	[illegible]	—	[illegible]	[illegible]	[illegible]	[illegible]	—	—	5,571	[illegible]
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	—	[illegible]	[illegible]
Add—Amount realised by the Public Works Department.	[illegible]	—	—	[illegible]	—	—	—	—	...	115
GRAND TOTAL .	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	—	[illegible]	[illegible]
1927-28 . .	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	...	[illegible]	[illegible]
1926-27 . .	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	[illegible]	[illegible]
1925-26 . . .	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	[illegible]	[illegible]
1924-25 . . .	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	—	[illegible]	[illegible]
1923-24 . . .	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	...	[illegible]	[illegible]

VII. *Remissions.*—No remissions were granted during the year.

VIII. *Working Expenses.*—The working expenses this year amounted to Rs 74,030 as compared with Rs. 81,128 in 1927-28 and Rs. 76,674 in 1926-27. The details of expenditure according to the accounts furnished by the Accountant General, United Provinces, *Public Works Department* are as follows :—

	Rs.	A.	P.
(a) Revenue management	11,102	0	0
(b) Cost of maintenance	*62,386	0	0
(c) Indirect charges	542	0	0
	74,030	0	0

	Rs.	A.	P.
* Works and repairs	54,245	0	0
Establishment	13,124	0	0
Tools and plant	1,293	0	0
Sundries	—6,276	0	0
	62,386	0	0

The expenditure during the year under report as compared with that of the previous year shows a decrease of Rs. 7,098 in the Ajmer, Beawar and Todgarh Sub-Collectorates. This is due to the fact that extensive repairs to tanks were carried out in the previous year.

IX. *Percentage on revenue and area assessed.*—The working expenses, *viz.*, Rs. 74,030, were less than the gross revenue assessed by Rs. 63,847. The incidence of working expenses for the area assessed was Re. 1 per ·44 acres.

X. *Actual collections and Expenditure of the year's Working.*—The actual revenue collections amounted to Rs. 1,46,917, which exceeded the working expenses by Rs. 72,887.

XI. *Experimental Cuttings.*—During the year under report experiments were made in the Beawar tahsil to ascertain the outturn of barley. Particulars of these are given in statement No. VI.

XII. The total area and estimated value of the produce of different kinds of crops irrigated in 1928-29 as compared with those of the preceding year are shown below :—

District	Crop Rate Tanks.		Fixed and Variable Tanks		Total for 1928-29.		Total for 1927-28	
	Area	Estimated Value	Area	Estimated Value.	Area.	Estimated Value.	Area.	Estimated Value.
	Acres	Rs.	Acres.	Rs	Acres.	Rs.	Acres.	Rs.
Ajmer	1,542	70,593	13,479½	5,48,178	15,021½	6,18,771	14,749½	7,65,613
Merwara	3,832	3,72,862	13,844	4,92,447	17,676	8,65,309	16,692¼	6,65,793
Total	5,374	4,43,455	27,323½	10,40,625	32,697½	14,84,080	31,441¾	13,31,[illegible]

E. C. GIBSON,

Commissioner, Ajmer-Merwara.

IRRIGATION WORKS IN AJMER-MERWARA DISTRICT.

Memo. explaining the differences in the working expenses of 1927-28 as compared with those of 1928-29.

Working Expenses.	1927-28.	1928-29.		Explanation of difference.
	Rs.	Rs.	Rs.	
Extension and Improvements and Maintenance.	56,220	54,245	1,975	More "Extension and Improvements" were found necessary in the Ajmer and Beawar Sub-Collectorates during the year 1928-29, but less expenditure was incurred on "Maintenance and Repairs" in all the three Sub-Collectorates during the year, as heavy repairs having been executed to the tanks in the previous year. The net result of these two factors is a decrease in expenditure.
Establishment	25,979	24,226	1,753	
Tools and Plant	1,350	1,293	57	
Sundries (Suspense) . . .	—2,983	—6,276	3,293	
Audit and Accounts Establishment	562	542	20	
TOTAL .	81,128	74,030	7,098	

D. N. MUKERJI,

Assistant Accounts Officer.

I.-B. IRRIGATION BRANCH.

Capital Account of Irrigation Works in Ajmer-Merwara for and to end of the year 1928-29.

Name of Sub-Collectorates.	DURING THE YEAR. Direct charges. Works.	Establishment.	Tools and Plant.	Profit and Loss.	Loss by Exchange.	Suspense account	Total.	Deduct receipts and recoveries on Capital account.	Net Total.	Indirect Charges. Capitalized abatement of Land Revenue	Leave and Pensionary charges.	Audit and Accounts Establishment	Total.	Grand Total.	TO END OF THE YEAR. Direct Charges. Works.	Establishment.	Tools and Plant.	Profit and Loss	Loss by exchange.	Suspense Account	Total.	*Deduct* receipts and revenue on Capital Account.	Net Total.	Indirect Charges. Capitalized abatement of Land Revenue.	Leave and Pensionary Charges	Audit and Accounts Charges.	Total.	Grand Total.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Tanks in Ajmer Sub-Collectorate	...	...	...	...	...	...	...		...	...			...		14,63,450	3,07,800	17,328	3,549	167	...	17,93,200	900	17,92,300	30,154	40,351	...	69,505	18,61,805
Tanks in Beawar Sub-Collectorate	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8,80,059	2,44,778	15,034		...	...	11,39,871	396	11,39,475	14,783	39,741	230	54,764	11,94,239
Tanks in Todgarh Sub-Collectorate	...	...	...	...	...	...	...	...	...	...	...	...			3,74,853	79,946	3,319	...	...	13,110	4,71,228	...	4,71,228	9,187	11,514	...	20,671	4,91,899
TOTAL	...	...	...	...	...	...	...		...	...		...			27,18,363	6,33,524	35,678	3,548	167	13,110	34,04,389	1,356	34,03,003	44,094	1,00,606	230	1,44,930	35,47,933

The figures given above are the same as those shown in the Capital Accounts for 1927-28 of the Annual Administrative Accounts of Irrigation of Ajmer Merwara District. No expenditure was incurred during 1928-29.

D. N. MUKERJI,

Assistant Accounts Officer.

Statement I-C.

IRRIGATION BRANCH.

Statement showing the financial results of Irrigation works in Ajmer-Merwara District for the year ending 1928-29.

Realization under Main Heads of Revenue and Working Expenses.

Name of Sub-Collectorates.	REVENUE (ACTUAL RECEIPTS). Irrigation. Water rates directly paid.	Irrigation. Portion of Land Revenue due to Works.	Irrigation. Total.	Navigation.	Plantation.	Water power.	Miscellaneous.	Total.	Deduct Refunds.	Gross receipts less refunds.	WORKING EXPENSES. Revenue Management. Establishment. Direction.	Executive.	Pensionary charges.	Civil Officers.	Total Revenue Management.	Maintenance. Establishment. Direction and Executive.	Pensionary charges.	Total.	Works.	Repairs.	Suspense (Sundries).	Tools and Plant.	Plantation.	Total cost of maintenance.	Indirect charges.	Grand Total Working Expenses.	Net Revenue.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
XIII-A.—IRRIGATION WORKS.																											
2.—UNPRODUCTIVE.																											
Tanks in Ajmer Sub-Collectorate .	6,372	54,243	60,615	...	...	...	2,987	63,602	...	63,602	...	...	198	4,595	4,793	4,484	628	5,112	9,458	11,671	−6,276	503	...	20,468	211	25,472	38,130
Tanks in Beawar Sub-Collectorate	14,621	39,411	54,032	...	...	...	2,798	56,830	...	56,830	...	...	159	3,978	4,137	4,118	577	4,695	10,104	9,301	...	403	...	24,563	194	28,894	27,936
Tanks in Todgarh Sub-Collectorate	4,018	21,227	26,145	...	...	...	340	26,485	...	26,485	...	...	104	2,068	2,172	2,910	407	3,317	2,837	10,874	...	327	...	17,355	137	19,664	6,821
TOTAL .	25,011	1,14,681	1,40,792	...	...	...	6,125	1,46,917	...	1,46,917	...	...	461	10,641	11,102	11,512	1,612	13,124	22,399	31,846	−6,276	1,233	...	62,386	542	74,030	73,887

D. N. MUKERJI,

Assistant Accounts Officer.

Statement II-C.

AJMER-MERWARA DISTRICT.

Statement showing the financial results of Irrigation, Navigation, Embankment and Drainage works for and up to the end of 1928-29.

No.	Name of works	General financial results to end of 1928-29. Mileage of operation: Main canals and branches	Distributaries	Estimated cost of construction (direct and indirect)	Date of completion of work	Date when system first came into operation	Total capital outlay (direct and indirect)	Accumulated arrears of interest.	Accumulated surplus revenue	Total sum at charge (column 7 and column 8).	Financial results of the year 1928-29. Gross receipts (direct and indirect)	Working expenses (direct and indirect).	Net Revenue.	Percentage on capital outlay, column 7.	Percentage on sum at charge, column 10	Interest.	Net Profit.	Net Loss	Area irrigated.	Percentage of working expenses to receipts (column 11 to column 12).
1	2	3	4	5	6a	6b	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Miles	Miles	Rs	Date.	Date	Rs	Rs.	Rs	Rs	Rs	Rs	Rs	%	%	Rs.	Rs	Rs	Acres	%
	XIII-A.—IRRIGATION WORKS.																			
	UNPRODUCTIVE WORKS																			
1	Tanks in Ajmer Sub Collectorate			18,61,806			18,61,805	18,40,336		37,02,141	63,602	25,473	38,130	2 05	1·03	59,599		21,468		40 05
2	Tanks in Beawar Sub Collectorate			11,94 229	..		11,94,229	8,41,776		20,36,005	56,830	28,894	27,936	2·34	1 37	39,599		11,606		50 84
3	Tanks in Todgarh Sub-Collectorate		..	4,78,789			4 91,899	2,57,342		7,49,241	26,485	19,664	6,821	1 39	0 91	15,918		9,097		74 25
	TOTAL	..	..	35,34,823	...		35,47,933	29,39,454		64,87,387	1 46,917	74,030	72,887	2 05	1 12	1 15,115		42,228		50 39

D. N. MUKERJI,
Assistant Accounts Officer.

Statement III-C.

Demand and realization during the year 1928-29 in the Ajmer-Merwara District.

Classes of works.	Balance of demand unrealized at the commencement of the year. Due.	Not due on account of Rabi.	Total.	Demand of the year. Water Revenue. Kharif.	Rabi.	Share of well assessment.	Difference between wet and dry rates.	Miscellaneous.	Total.	Total including balance at the commencement of the year.	Deduct remissions not including cash refunds.	Net Total.	Deduct amount unrealized at the close of the year. Due.	Not due.	Actual receipts of the year.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Crop Rate Tanks.																
Ajmer Sub-Collectorate	2,090	4,310	6,405	1,602	3,556	...	...	441	5,599	12,001	...	12,001	2,550	3,556	5,863	
Beawar do. .	...	8,071	8,974	6,210	4,001	..	...	801	11,063	19,932	...	19,932	..	4,901	15,031	
Todgarh do. .	...	3,681	3,681	1,042	3,127	...	...	93	5,065	8,630	..	8,649	121	3,327	4,891	
Total .	2,090	16,877	18,963	9,100	11,701	...	...	1,339	21,661	40,624	...	40,624	3,001	11,763	25,810	
Fixed and variably assessed old tanks.																
Ajmer Sub-Collectorate	615	22,696	23,311	10,116	10,533	12,471	3,605	2,517	54,144	77,455	...	77,465	3,217	16,543	57,706	
Beawar do. .	...	15,791	15,791	9,015	11,502	10,760	3,301	1,010	40,520	60,311	...	60,314	...	14,593	41,721	
Todgarh do. .	...	4,052	4,052	3,216	4,910	12,551	686	166	21,439	20,391	...	20,391	1	4,845	21,538	
Total .	616	43,112	44,057	32,341	35,074	35,701	7,395	1,625	1,16,163	1,60,160	...	1,60,140	3,221	35,975	1,20,961	
Grand Total .	2,731	60,280	63,020	40,891	47,767	35,701	7,395	6,613	1,37,761	2,00,784	...	2,00,784	6,222	47,768	1,46,801	

E. C. GIBSON,

Commissioner, Ajmer-Merwara.

Statement IV-C.

Statement showing the financial results of Irrigation Works in Ajmer-Merwara, for the year 1928-29 based on assessment of the year.

Principal results and operations for the year ending 31st March 1929.

Class of works.	Capital outlay (direct and indirect to end of year).	Revenue Assessment During the Year. Direct Revenue. Water Revenue.	Direct Revenue. Miscellaneous.	Direct Revenue. Total.	Indirect Revenue. Water Revenue.	Indirect Revenue. Share of well assessment.	Indirect Revenue. Difference between dry and wet rates.	Indirect Revenue. Total.	Grand Total	Working Expenses direct and indirect.	Net assessed revenue of the year.	Percentage on capital outlay to the end of the year.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13	14
CROP RATE TANKS.	Rs	Rs.	Rs	Rs	Rs	Rs.	Rs	Rs	Rs	Rs.	Rs	Rs	
Ajmer Sub-Collectorate		5,157	441	5,598	..	...	..	..	5,598	1,354	4,244	.	
Beawar do.	...	10,147	861	11,008	...		...	...	11,008	1,102	9,906	..	
Todgarh do.	...	4,969	86	5,055	...	...	.	...	5,055	734	4,321	...	
TOTAL		20,273	1,388	21,661		..	.		21,661	3,190	18,471		
FIXED AND VARIABLE ASSESSED OLD TANKS													
Ajmer	...	962	2,517	3,479	34,6.9	12,471	3,505	50 665	54,144	62	51,082	...	
Beawar	...	401	1,910	2,311	24,136	10,769	3,304	38,.03	40,520	33	40,487	...	
Todgarh	...	155	198	353	7,942	12,653	586	21,086	21,439	10	21,429	...	
TOTAL	...	1,518	4,625	6,143	66,767	35,798	7,395	1,09,960	1,16,103	105	1,15,998	..	
GRAND TOTAL	...	21,791	6,013	27,804	66,767	35,798	7,395	1,09,960	1,37,764	3,295	1,34,469	.	

E. C. GIBSON,

Commissioner, Ajmer-Merwara.

Statement I-E.

Statement of Areas irrigated by Irrigation Works in the Ajmer-Merwara District during the year 1928-29.

Class of works.	Areas irrigated and unirrigated in acres.									Average discharge in cubic feet per second.				Area irrigated per cubic foot per second.				Remarks.
	Kharif.		Rabi.					[illegible]		At Head.		[illegible]		Discharge at Head.		[illegible]		
	Irrigated.	Un-irrigated.	Irrigated.	Un-irrigated.	Total.	Flow.	Lift.	Area irrigated.	Percentage of total area.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
CROP RATE TANKS.																		
Ajmer	372½	167	776½	226	1,542	1,107	42	62	4·7	...	...	...	...		...	...	...	
Beawar	1,212½	307½	1,1[illegible]	162½	2,[illegible]	1,701½	557½	2[illegible]	12	...	...	...	...	...	...	...	...	
Todgarh	291½	19	648½	22½	982	751½	1[illegible]	123	16·2	...			...	...	...	...	—	
Total	1,877	493½	2,501½	412	5,371	3,[illegible]	[illegible]	51[illegible]	.			...		...	...	...	...	
FIXED AND VARIABLY ASSESSED TANKS.																		
Ajmer	5,2[illegible]	703	5,417½	2,[illegible]	13,473½	10,277½	311	1[illegible]	6	...	...	...	...		...	...	...	
Beawar	3,210½	518½	3,[illegible]	2,[illegible]	10,316½	6,757½	419½	[illegible]5	12	...	...	.	...	...	...	...	...	
Todgarh	784½	113½	2,177	119½	3,527½	2,378½	4[illegible]	7[illegible]	35	...	...	.	...	...		...	...	
Total	9,255	2,058½	11,563½	4,419½	27,323½	19,[illegible]	1,216½	1,676½	.	...	.	.	...	..	...	...	...	
GRAND TOTAL	11,132	2,551½	14,152½	4,961½	32,697½	23,219½	2,[illegible]	2,1[illegible]	..	..	...	...	...	.	.	...	...	

E. C. GIBSON,

Commissioner, Ajmer-Merwara.

P. W. D. Statement I-E.

Statement of Areas irrigated by Irrigation Works in the Ajmer-Merwara District during 1928-29.

Name of works.	AREAS IRRIGATED IN ACRES.							AVERAGE DISCHARGE IN CUBIC FEET PER SECOND.				AREA IRRIGATED PER CUBIC FOOT PER SECOND.				Remarks
						Double Cropped		At Head.		Utilized.		Discharged at Head		Utilized		
	Kharif.	Rabi.	Total.	Flow.	Lift	Area irrigated	Percentage of total area.	Kharif	Rabi	Kharif	Rabi.	Kharif.	Rabi	Kharif.	Rabi	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Eir	.	391	391	383½	7½	...	...	...		...	..	...	...	..	..	(27 01 / 391) = ·007 m c ft. per acre.
Rajosi		55	55	50	.	. .	...	...	...	..	...	...	...		.	(5 50 / 55) = 1·010 m c ft. per acre.
Makrera New Tank	...	.	...	.	..	. .	...	...	.	..	. .			..	.	
" Old Tank	...	.	...		...		...		...	.		...	...		...	
Ladpura New Tank	.	.	...	...	...		...	...	...	.	...	...	...	.	...	
Jalia Tank	763	557	1,320	914¾	405¼	427	32 3	..		...	.	.	...	...	.	(29 5 / 1320) = 0·0223 m c ft.
Balad Old and New Tanks	321	368¾	680¼	630½	49¾	229	33 2	...	..	.	...	. .		...	...	(26 2 / 639 5) = 0·041 m c.ft.
Chitar Tank	10½	15	25½	20	5½	7	29	...			.	.	...	...	...	(5 03 / 20) = 0 251 m c ft.
Total		.		.		.	...	..	. .	..	..	...	...	...	...	

Columns 9 to 16 re discharge are not applicable to tanks, vide Secretary, P. W. D.'s No 4595, dated the 14th December 1909.

E. C. GIBSON,
Commissioner, Ajmer-Merwara.

Statement II-E.

Statement showing Incidence of Working Expenses and Assessed Water Revenue on Irrigation Works in Ajmer-Merwara during the year 1928-29.

Class of Works.	Average discharge of the year at duct head in cubic feet per second.	Water Revenue Assessed.				Working Expenses, Direct and Indirect.	Area irrigated during the year.	Working Expenses.		Water Revenue per acre irrigated.		Remarks.
		Direct.	Indirect.	Miscellaneous.	Total.			Per cent. on gross revenue.	Per acre irrigated.	Direct.	Indirect.	
1	2	3	4	5	6	7	8	9	10	11	12	13
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Acres.	Rs.	Rs.	Rs.	Rs.	
CROP RATE TANKS.												
Ajmer Sub-Collectorate	...	5,157	...	411	5,598	1,354	1,149	24·1	1·18	4·9	...	
Beawar do.	...	10,147	...	861	11,008	1,102	2,379¼	10·0	46·3	4·2	...	
Todgarh do.	...	4,969	...	86	5,055	734	910¼	14·5	·78	5·28	...	
Total	...	20,273	...	1,388	21,661	3,190	4,468¾	...	...	...	...	
FIXED AND VARIABLY ASSESSED TANKS.												
Ajmer Sub-Collectorate	...	962	50,665	2,617	54,144	62	10,677¼	·16	·006	...	3·2	
Beawar do.	...	401	38,209	1,010	40,520	33	7,176¾	·08	·45	·05	5·3	
Todgarh do.	...	155	21,086	198	21,439	10	2,961¼	·04	·004	7·2	...	
Total	...	1,518	1,09,960	4,625	1,16,103	105	20,815¼	...	...	...	...	
GRAND TOTAL	...	21,791	1,09,960	6,013	1,37,764	3,295	25,284	...	...	...	...	

E. C. GIBSON,

Commissioner, Ajmer-Merwara.

P. W. D. Statement II-E.

Statement showing Incidence of Working Expenses and Assessed Water Revenue on Tanks in Ajmer-Merwara during 1928-29.

Name of work.	Average discharge of the year at Canal head in cubic feet per second.	Water rate assessed					Gross assessed Revenue from all sources.	Working expenses direct or indirect.	Acres irrigated during the year.	Working expenses			Occupier's rate.		Total water rate direct and indirect.		Remarks.
		Occupier's.	Owner's.	Direct.	Indirect	Total direct and indirect				Percentage on gross Revenue.	Per acre irrigated.	Per cft. per second of discharge of canal Head.	Per acre irrigated	Per cft per second of discharge of canal Head.	Per acre irrigated.	Per cft. per second of discharge of canal Head.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Rs.	Rs.	Rs.	Rs.		Rs.	Rs	Rs A. P.	Acres.	Rs	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Bir Tank	...	...	...	1,219	...	1,219	1,219	210 2 0	319	17·3	6 3	...	..	.	3·82	...	
Rajosi	...	...	..	314	...	314	314	144 0 0	55	45 00	2 25	..	...	...	5·7		
Jalia new Tank	...	...	...	5,479	...	5,479	5,757	383 0 0	1,320	6 6	·29	...	...	..	...	...	
Balad new or old Tank.	...	..	...	3,345	...	3,345	3,618	392 0 0	689¼	10 8	·56	...	...	...	..	...	
Chitar Tank	..		..	116	...	116	128	118 0 0	20	93 2	5 9	.	.	...	...	...	
	...	.	..	...	...	...	..	...		..	...		...	.	..	.	

E. C. GIBSON,
Commissioner, Ajmer-Merwara.

Statement III-E.

Statement of Quantity and Value of Crops irrigated and unirrigated in the Ajmer-Merwara District during the year 1922-23.

Name of Crops.	Area	Value	Area	Value	Area	Value	Area	Value	Area	Value	Area	Value	Area	Value	Area	Value	Area	Value	Area	Value	Remarks
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Orchard and Garden produce—Vegetables, [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Sugarcane	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Cereals—Wheat	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Cereals—Barley	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Cereals—Rice	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Cereals—Maize	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Cereals—Jowar	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Cereals—Bajra	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Miscellaneous grains	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Pulses—Gram	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Pulses—Moong, Moth	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Pulses—[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Fodder Crops—Lucerne, &c.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Fibres—Cotton	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Oil Seeds—Til	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Narcotics and Drugs—Tobacco	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Narcotics and Drugs—Opium	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Miscellaneous	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Land irrigated but not cropped	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Methi	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Chillies	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

E. C. GIBSON,

Commissioner, Ajmer-Merwara.

Statement IV-E.

Comparative Statement of Irrigation and Rainfall for the year 1928-29 in the Ajmer-Merwara District.

Civil District.	Of the Civil District: Total area in acres.	Of the Civil District: Culturable area in acres.	Of the Civil District: Cultivated area in acres	Works supplying irrigation: No.	Works supplying irrigation: Name.	Culturable area commanded by the Irrigation Works in column 6 in acres.	Area at present estimated as annually irrigable by the works specified in column 6.	Area irrigated in acres 1927-1928: Kharif.	1927-1928: Rabi	1927-1928: Total	1928-1929: Kharif.	1928-1929: Rabi	1928-1929: Total.	Rainfall Inches: 1927-1928	Rainfall Inches: 1928-1929.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CROP RATE TANKS	Ajmer-Sub-Collectorate 3,87,548 Beawar do 2,02,789 Todgarh do. 1,44,708 7,15,045	Ajmer Sub-Collectorate 2,21,750½ Beawar do. 69,668 Todgarh do. 22,481½ 3,13,904	Ajmer-Sub-Collectorate 1,85,016½ Beawar do 52,238 Todgarh do 11,711½ 2,48,966												
Ajmer Sub-Collectorate					...		1,497	133½	1,005½	1,139	372½	776½	1,149	25 53	22·43
Beawar Do.				.	..	3,135	1,804	405¾	1,892¾	2,298¼	1,520	1,330	2,850	25 06	20·44
Todgarh Do.				...	.	.	351	48¼	692¼	739	291¾	648¼	940½	33 69	25·37
TOTAL				...		3,135	3,652	585¾	3,690¾	4,176½	2,184½	2,755	4,939½	..	...
VARIABLE TANKS.															
Ajmer Sub Collectorate						12,412	12,916	2,960	6,365½	9,325½	5,050¼	5,181	10,231¼	.	..
Beawar Do.						5,196	3,177	954½	3,180¾	4,135¼	1,651½	3,071½	4,723		.
Todgarh Do.					..	740	981	70¾	876¼	947	254¾	789½	1,044¼	...	...
TOTAL						18,347	17,074	3,985¼	10,422¼	14,407¾	6,956½	9,042	15,998½		...
FIXED TANKS.															
Ajmer Sub-Collectorate						4,869	5,170	157	364	521	209½	236½	440	.	..
Beawar Do.						6,154	2,691	713¾	2,224¼	2,937¾	2,378	3,215¾	5,593¾		.
Todgarh Do.				.		1,747	1,057	136½	1,488	1,624½	517	1,387½	1,004¼	.	.
TOTAL						14,770	9,818	1,006¾	4,076½	5,083¼	3,104½	4,839½	7,944¼		
GRAND TOTAL				..	.	36,252	30,544	5,577¾	18,089¾	23,667¼	12,245¾	16,036¾	28,882	..	...

NOTE.—When a Civil District is irrigated from two or more irrigation Works, columns 7—14 inclusive should be totalled separately for each Civil District so irrigated

E. C. GIBSON,

Commissioner, Ajmer-Merwara.

Statement F.

Statement showing the operations of irrigation works in the Ajmer-Merwara district for the year 1928-29.

	Amount due. Water Revenue. Kharif.	Amount due. Water Revenue. Rabi.	Amount due. Miscellaneous.	Amount due. Share of well assessment.	Amount due. Difference between wet and dry rates.	Amount due. Total.	Remission. Kharif.	Remission. Rabi.	Suspension. Kharif.	Suspension. Rabi.	Water Revenue. Kharif.	Water Revenue. Rabi.	Miscellaneous.	Share of well assessment.	Difference between wet and dry rates.	Total.	Remarks.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
CROP RATE TANKS.																	
Ajmer [illegible] rate	1,602	3,555	141			5,598	..		..	.	1,602	3,555	141	..	...	5,598	
Beawar do.	5,216	4,901	861	.	..	11,003	.		..	.	5,216	4,901	861	...		11,008	
Todgarh do.	1,642	3,327	86	...	.	5,055	.	...	..	...	1,642	3,327	86	..	...	5,055	
Total	8,490	11,783	1,388	.	...	21,661	...	.	..	...	8,490	11,783	1,388	.	...	21,661	
VARIABLE AND FIXED TANKS.																	
Ajmer [illegible] rate	19,118	16,533	2,517	12,471	3,505	54,144	...		...	...	19,118	16,533	2,517	12,471	3,505	54,144	
Beawar do.	9,915	14,592	1,910	10,769	3,301	40,520	..	...	...		9,915	14,592	1,910	10,769	3,301	40,520	
Todgarh do.	3,248	4,849	108	12,558	586	21,439	.	.		...	3,248	4,810	108	12,558	586	21,439	
Total	32,311	35,974	4,625	35,798	7,395	1,16,103	..	.	..		32,311	35,974	4,625	35,798	7,395	1,16,103	
GRAND TOTAL	40,801	47,757	6,013	35,798	7,395	1,37,764	.		...		40,801	47,757	6,013	35,798	7,395	1,37,764	

E. C. GIBSON,

Statement VI.

Statement of experimental cuttings of Crops in the Ajmer-Merwara District during 1928-29.

Tank.	Village.	Name of Cultivator.	Harvest and area of Field.	Area cut.	Distance of field from Tanks	Whether irrigated by lift, or flow, and number of waterings.	Weight of Grain cut	Weight of straw cut	Produce per acre		Value per acre			Deduct Expenditure	Profit	Remarks.
									Grain.	Straw	Grain.	Bhusa.	Total.			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
					Yds.											
AJMER																
BEAWAR											Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
Devatan . . .	Bhanbipura	Natha, son of Hera Balai	Rabi 1336, 10 Biswas	5 Biswas	3 Furlong	Flow 3 times	40½ lbs	46 lbs	405 lbs	460 lbs	20 4 0	3 13 0	24 1 0	15 0 0	9 1 0	Barley
Kalinjar . . .	Rajiawas .	Dhanna son of Buddha Potter	Rabi 1336, Big 2, Bis 3, Biswansis 10	5 Bigs	2 „	Flow 3 times	39 „	57 „	390 „	170 „	19 8 0	4 12 0	24 4 0	15 0 0	9 4 0	„
TODGARH																

E. C. GIBSON,
Commissioner, Ajmer-Merwara.

REPORT

OF THE

Committee appointed to enquire into certain questions connected with the supply of motor cars to Government Officials.

Dated 1st February 1911.

From—The Motor Car Committee,

To—The Secretary to the Government of India, Finance Department.

We have the honour to submit the following report of the enquiry which we were directed to make into certain questions connected with the supply of motor cars to Government officials. The appointment of a Committee to make this enquiry was anticipated in paragraph 1 of the letter from the Government of India in the Finance Department, No. 1447-Ex., dated 16th March 1909, and the Secretary of State was informed of the proposal in financial despatch No. 128, dated the 26th May 1910.

[illegible]stituted included besides the signatories [illegible] Carthy. Mr. Cleveland owing to absence [illegible] the Committee's preliminary meetings [illegible]ign this report. Mr. MacCarthy left for [illegible]h from paragraph 27 onwards had been taken up, but indicated his acceptance of the recommendations in paragraphs 6—18 in which technical questions are discussed and was also in accord with the recommendations contained in paragraphs 19—26.

3. The Committee were asked to report on the following points:—

(a) the types and approximate cost of cars for the different classes of officers whom Government decides to supply with cars at public expense;

(b) the cost of maintenance of cars including wages and uniforms of chauffeurs; and also including garage accommodation and provision for the storage of petrol;

(c) the method of charging officers for their private use of the Government cars supplied to them;

(d) the propriety of the existing rules governing the travelling allowance drawn for journeys in Government cars;

(e) the advisability of getting Government cars through the India Office, or of making special contract arrangements for supply and repairs with selected firms in India.

Subsequently the Committee's enquiries were restricted to the following points:—

(1) The cost of maintenance of cars including wages and uniforms of chauffeurs; and also including garage accommodation and provision for the storage of petrol. [For the purpose of this instruction two sets of figures were suggested (*i*) for a low horse power single cylinder car, (*ii*) for a four cylinder 12—16 horse power four seated car.]

(2) The method of charging officers for their private use of the Government car supplied to them.

(3) The propriety of the existing rules governing the travelling allowance drawn for journeys in Government cars.

The Committee were also asked to obtain from Mr. MacCarthy a note of the results of his enquiries into questions of cost and type, to be forwarded as an appendix to their report.

4. Mr. MacCarthy made a tour of investigation to various centres in India including Bombay, Poona, Madras and Calcutta and the results of his enquiries are appended to this report in the following notes :—

(a) Note on some technical points in connection with the working of motor cars in India.

(b) Estimate of the probable cost per mile of running a 12—16 H. P. Renault car costing, in round figures, Rs. 8,000.

(c) Estimate of the probable cost per mile of running an 8 H. P. De Dion single cylinder car costing with all accessories Rs. 5,000.

(d) Specification of motor cars for the use of Government officers in India.

5. We were not instructed to report upon these recommendations in detail, but have found it necessary to touch upon them in order to obtain a basis for our replies to the matters specifically referred to us. We may note here that we are in agreement with Mr. MacCarthy as to the necessity of Government cars being of first rate materials; and that there are various minor suggestions in his notes which deserve the consideration of Government: in particular the recommendation that every car should be provided with a milometre.

I.—Calculation of mileage cost of purchasing and maintaining a Government car.

6. We now proceed to indicate broadly how far we accept Mr. MacCarthy's estimates of cost. On this point we shall deal only with his note (b). Regarding the items included in these estimates we would make the following observations :—

(1) *Cost of petrol.*—Accepted.

(2) *Cost of tyre renewals.*—Accepted. It should be remembered, however, that the price of tyres is subject to considerable fluctuation.

(3) *Cost of lubricants.*—Accepted.

(4) Government cars are not likely to be used for night work for official purposes to any appreciable extent, and it is considered that *illuminants* do not require to be taken into consideration for purposes of estimating. Any small expense incurred should be met by the user of the car in the event of the adoption of any scheme which throws the running charges on him instead of on Government.

(5) *Cost of minor repairs and replacements.*—This is probably a somewhat liberal allowance (to an officer who himself understands car management) in the earlier years of a car's life, and possibly an underestimate in the latter years; but it would be an unnecessary refinement to attempt to differentiate according to the age of the car.

(6) *Cost of annual varnishing.*—This is accepted.

(7) *Cost of periodical overhaul.*—Having regard to the unmistakeable tendency for Government cars to be less carefully treated than cars in private ownership, and to the probable tendency to defer renewals wherever possible until the periodical overhaul in the event of Government deciding that the cost of minor repairs shall be borne by the user; and also to the fact that it may be necessary to incur incidental expenses not provided for in Mr. MacCarthy's estimate in conveying the car to and from a suitable workshop, we think that the estimate here given is somewhat too low. We would take Rs. 300 as the cost of the first overhaul and Rs. 350 for the second. (It will be seen later that we do not propose to retain the car long enough for a third overhaul to be required.)

(8) *Pay of chauffeur.*—We think that as the bulk of the official cars will probably be used in presidency towns, it would be safer to take a higher figure, say Rs. 60.

(9) *Pay of cleaner.*—The figure given, Rs. 5, is somewhat low, especially in presidency towns. We take Rs. 10, therefore, this sum to include also cleaning materials, such as brass polish, dusters, etc.

(10) *Uniform for chauffeurs.*—Accepted.

(11) *Garage accommodation and petrol storage.*—We do not think any figure should be included on this account in the estimate of the average or standard cost of maintaining Government cars ; in almost all cases the officer will find the accommodation himself without incurring recognizable expense. If on isolated occasions he has to pay for garage accommodation, he should be required to meet the charge himself, being regarded as recouped under the travelling allowance system. If appreciable and continuous expenditure is required [illegible]

[illegible] extra expense incurred in this direction.

(12) *Insurance.*—The rate proposed is taken from a standard form of insurance (Messrs. Shaw, Wallace & Co.'s) and is accepted for the purpose of an estimate. We think that in any estimate of the expenditure really involved in running a car, a charge should be included on this account, whether Government actually insure or not. In this connection we desire to emphasize the fact that in practice almost the whole risk will fall on Government, partly owing to the frequency with which, when an accident occurs, it will be possible to give the journey at least a *quasi*-official character, and [illegible] of Government to press [illegible] It is also worth noting [illegible] claims (for which it may perhaps be thought that the user should be made responsible) is apparently very small : the insurance prospectus which we have had before us appears to indicate that the additional premium on this account is ¼ per cent. or only Rs. 20 per annum in the case of a car worth Rs. 8,000.

(13) *Interest on capital cost and depreciation.*—We will deal with this item, which raises the whole question of the normal life of a car, at greater length.

Estimated life of a car

7. We assume that the cars purchased for Government will be of first class manufacture, and will be in the hands of trained chauffeur-mechanics. Under these conditions the possible mileage life of a car is extremely long. One of us knows a car [illegible] is still used for commercial pur[illegible] class manufacture and very high p[illegible] d. on being recently completely [illegible] he wheels) which was practically indistinguishable from that of a new car. A Government car, even if reasonable private use is allowed, is not likely to do anything like the same annual mileage as a car used for commercial purposes, *e.g.*, as taxicabs which it is believed [illegible] considerations make it probable that the [illegible] ter, [illegible] greater reference to its age and out-of-date [illegible]

sale too long may mean Government getting no appreciable [illegible] note with reference to this question that there is practically no available experience of the retention of cars for so long a period as ten years, or of the market which they command at the end of that period. On the whole and until further experience is gained and questions of type more closely approach finality, we

should be inclined to recommend that estimates of cost be based upon the assumption of sale after seven years' use by Government officers.

Estimated sale price of car after seven years' use.

8. We would take interest at $3\frac{3}{4}$ per cent. for the purpose of these calculations, and would take Rs. 2,000 as the value of a car of the grade which Mr. MacCarthy's calculations postulate after seven years' legitimate use.

Estimated annual mileage.

9. For the purpose of estimating the mileage cost, we accept the assumption underlying Mr. MacCarthy's calculations that the car runs 5,000 miles in one year. Such statistics for Government cars as are available would in fact suggest a lower figure. It is uncertain however how far officers to whom Government cars have been provided in the past have felt themselves at liberty to use them freely for private purposes. Allowance must also be made for the idiosyncracies of individual car users. Thus while one officer may travel 5,000 miles in a year, another officer in the same appointment, either through greater activity in his public duties or by using the car more freely for his private travelling, may perform a mileage of as much as 6,000 or 7,000 miles. It is unlikely however that in any but quite exceptional cases, where the necessity for abnormal travelling is already well-known, that a maximum of 7,000 will be exceeded. In order to obviate the difficulties attendant on a consideration of minor variations in the distance travelled and to enable as many as possible of the cases which are likely to arise to be disposed of under a few broad rules, we have framed our proposals in such a way that the distance annually travelled will not ordinarily be a factor requiring to be taken into consideration. It is only when a claim is put forward for special relief on the ground that an officer's annual mileage necessarily exceeds 7,000 miles that our proposals contemplate an investigation into this question.

Summary of mileage cost of purchase and maintenance.

10. Mr. MacCarthy's estimate of the cost per mile of maintaining the type of car which he recommends (12—16 horse power) after modification as above suggested will stand as follows :—

	Rs.
Cost of petrol	0·0626
„ tyre renewals	0·2036
„ lubricants	0·0200
„ minor repairs	0·0250
„ annual varnishing	0·0150
„ periodical overhaul	0·0186
„ pay of chauffeur „ „ cleaner „ uniform for chauffeur }	0·176
„ insurance	0·0342
„ interest on capital cost and depreciation	0·21108
	0·76608

II.—Items of cost of maintenance which should be borne by the officer using a Government car.

Impracticability of exact adjustment between allowances and maintenance charges.

11. In dealing with the question of travelling allowances, we wish to emphasize the impossiblity of an absolutely precise adjustment between running charges and the allowances granted to cover this expense (should it be thrown upon the officer) and other expenses incidental to touring. We are not aware that the ordinary travelling allowance rules ever really rested on such a basis, and if they did, the original assumptions must long ago have been vitiated by subsequent changes in prices and wages. In the case of cars, an exact adjustment would have to take account not only of similar fluctuations (possibly, for example, wholly upsetting such an important datum as the cost of tyres) but also of differences in the size and type of cars supplied to different officers and of variations in the efficiency of the same type of car according to its age and treatment.

12. In view of the tendency for Government cars to be less carefully treated than cars in private ownership we consider it essential that those running expenses which are largely dependent as regards amount on the continued efficiency of the car and carefulness of management should be borne by the officer. The charges to which we refer are the cost of petrol, tyres, lubricants, and minor repairs and replacements. We would also, as a matter of convenience, include petty cleaning requirements and (as already stated) illuminants and occasional storage charges.

Running charges to be borne by car user.

13. As regards repairs and replacements, we understand that the ordinary insurance policies do not provide for renewals and replacements costing less than Rs. 50. We do not think it expedient to throw on the officer the whole cost of

Repairs and replacements

to discourage frequent recourse to the local workshop or garage and the running ... control except ... for all replace- ... insurance, or

component as proved in the officer's claim, though not for any workshop charges on account of the examination of the defective car and the setting up of the new part.

their successors

14. We are strongly of opinion that only fully trained chauffeur-mechanics should be employed on Government cars, and that definite instructions as to the ... should be laid down by Local Governments

Chauffeurs.

... if it is desirable to emphasize ... the officer, it would of course ... to the officer and leave him to ... disposed to recommend. We would add ... himself nor any other person should be ... such tests of competence as the Local Government may prescribe.

15. As regards insurance, we are of opinion that it is advisable that cars should be insured whether by Government (as a departure from their recog- ...

Insurance.

number of difficulties and discussions, ... by Government which have not been prominent in the past only because no control ...

count is not in our opinion worth making. The advantage gained by ... in this way might be regarded as a set-off to any excess expenditure, over and above the amount which we have assumed for repairs and *replacements*, such as an inexperienced officer may easily find himself obliged to incur.

16. We do not think it necessary to recover anything from the officer in respect of interest on capital cost and depreciation. In regard to this and some of

Interest on capital cost and depreciation.

the other points mentioned above, it may be noted here that except in so far as one alternative may tend more than another to encourage economy and careful management, it is a matter of indifference whether additional charges are thrown on the officer and a more liberal scheme of travelling or conveyance allowance is proposed, or whether he is relieved of some of the maintenance charges, with a corresponding reduction of allowances.

Procedure on transfer of officers using Government cars.

17. If the officer using the car is made responsible for its running charges and minor repairs, it will be important to provide some means for ascertaining the condition of a car when an officer is transferred and the responsibility is undertaken by his successor. What is required, wherever practicable, is a report by competent authority:

(*a*) as to whether current repairs have been duly carried out, and

(*b*) as to the value of the tyres at the date of the car's transfer to another officer.

The Local Government or the Commissioner might be left to settle the authority by whom this inspection and valuation should be carried out. In the event of its being necessary immediately to undertake repairs which should have been carried out by the outgoing officer, it should be arranged that the latter shall be required to pay the cost to the incoming officer. The incoming officer, on the other hand, should pay the outgoing officer for the value of the tyres as they stand at the time of the transfer. If for any reason the incoming officer is permitted to refuse to take over a Government car (*e.g.*, because he possesses a car of his own), the payment for the tyres should be made by Government.

Cost per mile of charges to be thrown upon car user.

18. If the above recommendations are accepted, we estimate, assuming an annual mileage of 5,000, that the officer will have to pay for every mile which the car runs Rs. 0·31.

III.—Regulation of travelling and conveyance allowances.

Classification of officers using Government cars.

19. We now come to the adjustment of travelling and conveyance allowances. The subject may be dealt with under the three heads :—

(*a*) cars used mainly for touring purposes, *i.e.*, for official journeys beyond the immediate neighbourhood of an officer's station, which if performed on horseback would entitle the officer to the ordinary halting or mileage allowances;

(*b*) cars used mainly for station and city work, *e.g.*, by a District Magistrate or police officer in large urban centres for journeys which if performed on horseback would either not entitle the officer to allowances at all or only to some fixed conveyance allowance determined with reference to the number of horses kept;

(*c*) cars mainly used for touring purposes as in (*a*) by officers who receive fixed monthly travelling allowance.

Regulation of private use.

20. Before we go further, it will be convenient to state our views on the question of private use. We are of opinion (following the majority of the Local Governments) that the reasonable private use of official cars should not be prohibited unless in the case where it is on other grounds found desirable to adopt the Bombay practice of allotting a single car to the use of several officers. (1) It will be extremely difficult to distinguish between official and *quasi*-official use, and it will be not to the advantage of Government to attempt to enforce an impractiable distinction which their officers will be strongly tempted to evade. (2) The prohibition of private use will not tend entirely in the direction of economy. In the first place, an officer is much more likely to take a continuous personal interest in the management of a car if it is his ordinary station conveyance. In the second place since the question whether special rules for the travelling allowances of car-user, are required must ultimately depend on the extent to which the supply of a car relieves the officer of expense, Government will have to give more liberal allow-

ances than would otherwise be necessary if they compel him to continue to keek up separately sufficient conveyance for all his private requirements. An officer in a large station, for example, who also had heavy touring, might still need for his private station work all the horses which now suffice for both his private and official work. (3) We think too that Government may well recognize the benefit which they themselves gain by the shortening of the time spent every day in locomotion. In the case of many hard-worked appointments this will often represent so much additional time or efficiency for Government work. (4) In so far as events confirm our anticipation that the life of Government cars will in practice be determined by the tendency of a car to become obsolete rather than by the actual mileage done, the additional work involved in the private use of a car by an officer who himself pays its running expenses will not ultimately involve any serious cost to Government. The sale price of a really old car tends to be a conventional figure rather than to vary directly with the mileage done, of which after seven years the purchaser would usually not expect to obtain correct particulars.

21. It may be recognized, however, that the grant of the privilege of private use is a valuable concession which needs to be safeguarded. A certain check will be automatically imposed by the fact that the officer will have to pay for the running expenses, amounting to five annas a mile; but that check will not in all cases be sufficient. We think Government should lay down that the permission to use a car for private purposes is intended to cover ordinary movements within the officer's station, and does not authorise him to undertake long runs for recreation or to use the car as a substitute for the railway during casual absences from head-quarters. The loan of the car to other persons for private use should also be definitely prohibited, and as we have said above, no unqualified person should be permitted to drive the car under any circumstances whatever. We think controlling officers should be moved to take steps to see that these instructions are generally observed, and that it should be understood by all concerned that failure to observe them can only

gether. With these explanations, we t

system without imposing more rigid

to require every officer using a Government car to report to his official superior

the last report

(if granted, as

not in itself indi-

al journeys will

have been too short for mileage allowance to be claimed, and it is out of the

22. We now deal with the travelling allowance of the touring officer [clause (*a*) of paragraph 19]. The principle underlying our proposals is that if the cost of travelling in the case of the officer who uses a Government car can be made equal to the cost of doing the same travelling by means of horses, there is no need to differentiate between the two cases in regard to travelling allowance, except to a minor extent.

Allowances of "touring officer."

23. An officer is not likely to need a Government car unless his official work

horses, and

his number

ile under our

It has also

provision of a car

if a horse and trap

-user will probably

On the whole, we

think our proposals do establish that practical identity of conditions as regards cost to which we referred in the preceeding paragraph.

24. So far then, we might infer that the ordinary travelling allowance rules should be applied to the car-user without modification. The possession of a car will however enable an officer to undertake more travelling than he previously attempted, and in particular, to undertake very long journeys unaccompanied by servants and baggage, which, under ordinary conditions, though not impracticable and indeed sometimes necessary, are probably avoided as much as possible. We are reluctant to suggest that an officer will undertake such journeys merely to gain additional travelling allowance, but controlling officers must be on their guard against such a possibility, and the discharge of this duty will be distasteful, and likely to be resented by the officer. It is desirable therefore to obviate the necessity for this scrutiny as far as possible by means of an automatic check. The check which we suggest is that in the case of any single journey exceeding 20 miles, the ordinary mileage rate of 8 annas should be drawn for the first 20 miles only, and that a reduced rate of 6 annas should be applicable thereafter. The reduced rate will still provide for the cost of running of the car, with a margin of one anna a mile for subsidiary expenses. This margin, together with the balance of 3 annas mile on the first 20 miles, should we think suffice in the long run. Any officer now using horses, whose travelling already includes an unusual proportion of journeys over 20 miles, will of course lose to some extent by this modification of the ordinary rule when he obtains a Government car; but he will at any rate be far less likely to have his good faith brought into question.

25. If some such automatic check upon excessive travelling is imposed, we think that Government may well look with equanimity upon the increase of official travelling which is sure to occur whenever cars are supplied, and regard it in fact as one of the advantages which they obtain from the new means of locomotion.

26. Our proposals in regard to the touring officer apply equally to officers of clause (*b*) of paragraph 19 above on occasions when they use their car for ordinary touring purposes.

Allowances of "city officer."

27. We now deal with the general case of these officers. There are several differences between the two cases. The "city officer", as we may call him, usually resides in a large station, and in most cases will have a heavy private mileage to get through every day in going about between his residence, his office, his club, and so forth. The touring officer has from time to time to post relays of horses for long official journeys, and the length and frequency of such journeys may actually be the factor which determines the total number of horses kept by him. The requirements of the city officer, whose travelling is fairly evenly distributed, can be described with less artificiality as represented by so many animals for official and so many for private work. In the second place the possession of a car will also sometimes enable the city officer to dispense entirely with horses, as he can generally obtain other means of conveyance locally in the event of the temporary breakdown of the car. It is true that the provision of a car does not give him enlarged opportunities of earning travelling allowance, but our previous proposals make it, as we think, unnecessary to take this circumstance into account. On the whole we consider that it should be definitely recognized that the city officer provided with a Government car is a material gainer in his private capacity and should be prepared to contribute up to a comparatively high maximum figure for the use of the car.

28. In the next place we consider that in dealing with the "city officer" some account must be taken of the probability that the higher-paid officers in urban centres will in a few years, in the majority of cases, supply their own cars unless Government has come forward to help them. The more that becomes the practice the greater will be the concession involved in the supply of a Government car, for which the officer has only to pay the running expenses while he is saved the whole of the indirect charges, the importance of which is so clearly brought out in Mr. MacCarthy's calculations.

29. At the same time it appears to us to be necessary to distinguish sharply, in the case of officers falling under clause (*b*) of paragraph 19, between the higher and the lower-paid classes. In the "higher-paid" classes we include such officers

as District Magistrates, Commissioners of Police, and so forth. In the "lower-paid" classes we include (for example) the bulk of police officers. We do not think it necessary ourselves to indicate how the line should be drawn between the two, as this can be better done by the Local Governments, but that some distinction is required is we think *unquestionable*. The "*higher-paid*" *officer* can be expected to incur for his private and public conveyance a far higher charge than Government have the right to assume in the case of officers on comparatively low pay.

[illegible]

[illegible] viously specified :—

Annual distance travelled.	Monthly cost at 5 annas * a mile.
	Rs.
5,000	130
6,000	156
7,000	182
8,000	208
9,000	234
10,000	260

As we have remarked in paragraph 23, Government cars are hardly likely to be required unless an officer's work otherwise involves the maintenance of 3 or 4 horses and a trap, at a real cost of about Rs. 150 a month. In other words, the city officer could pay the running charges for an annual mileage of 6,000 out of his own pocket without incurring a higher expense than he now does. For the reasons indicated in paragraphs 27 and 28, and particularly the latter paragraph, we think that the "higher-paid" city officer who receives a Government car may be expected to meet even a higher charge than he now incurs on horses, and that an additional Rs. 30 a month is not too high a figure to pay for the greater convenience of the car.

We would propose therefore to lay down the rule that a "city officer" belonging to the higher-paid class shall pay the running expenses of the car without receiving any conveyance allowance, provided that his annual mileage does not exceed 7,000 miles.

Where it can be shown that, with due control over private travelling, the annual mileage necessarily exceeds 7,000, a case for a conveyance allowance will arise, and the amount of this allowance should roughly correspond to the extra charge thrown on the officer by the excess mileage above 7,000. For example, if a standard of 8,000 miles can be established, a case would arise for the grant of a [illegible] of Rs. 25 a month. It is not contem- [illegible] time to time on the [illegible] that when the matter first comes up for enquiry in any individual case, an approximate standard shall be fixed and a conveyance allowance, also in round numbers, granted for a term of years

31. In the case of the lower-paid officer, we do not think it is right to require, even allowi[illegible] of his having a motor car for private as well as public use, [illegible]

But instead of attempting to differentiate closely between the varying distances run, we should prefer to rule broadly that an officer belonging to the lower-paid class shall

* The assumption that the rate of 5 annas a mile holds good for the larger mileages is of course not strictly accurate, but as the bulk of the elements of the calculation (cost of petrol, tyres, etc.) represent charges which do vary directly with the mileage, the error is not of importance in the present connection.

receive an allowance of Rs. 60 a month and meet all running charges up to a mileage of 7,000 miles, the allowance being increased for any established excess above that amount in the same way as proposed in the case of the higher-paid class.

32. We assume that, if these proposals are accepted, existing conveyance allowances [as distinguished from the fixed travelling allowances referred to in clause (c) of paragraph 19] will be withdrawn.

Alternative system of allowances for "city officer."

33. We have alluded in paragraph 28 to the probability that officers in urban centres will in a few years in almost all cases supply their own cars. For this reason we think that an alternative method of dealing with the case of the city officer might possibly be worth trial, namely, in the case of certain appointments, to offer allowances to officers who maintain their own cars. Mr. MacCarthy has shown that the whole cost of supplying and maintaining a car may be taken at 12 annas a mile, of which under our proposals Government are left in all cases to pay seven. This on a mileage of 5,000 involves a charge to Government of as much as Rs. 180 a month even where no conveyance allowance is given, and we think that in very many cases an allowance of a much smaller amount would suffice to incline an officer to the alternative of private purchase. An incidental advantage of such a system would be that the allowances could be granted in the first instance for a term of years only (say five) after which it might be found possible to discontinue the practice of Government assistance in any form, at any rate in the case of the better paid appointments.

Officer with fixed travelling allowance.

34. Lastly, we come to the case of the officer with a fixed travelling allowance [clause (c) of paragraph 16]. The fixed allowance in this case takes the place of the ordinary halting and mileage allowances, and it would seem reasonable to infer that if the ordinary travelling allowance rules can be left substantially unchanged in the case of the touring officer who uses a car, any fixed touring allowances at present granted may similarly be allowed to stand, subject to the payment by the officer of the running charges. At present a deduction of Rs. 3 is made from the monthly allowance for every day on which the officer uses a Government car. In effect our proposal theoretically involves approximately the same payment by the officer if he travels 10 miles, and a smaller or greater payment according as the journey undertaken is less or greater than that length. In practice the officer with a fixed allowance will no doubt have to pay more in meeting the running charges than he now pays in the form of deductions form his fixed allowance : and this we think is fully justifiable.

Journeys partly by car and partly by ordinary conveyance.

35. In the case of road journeys, partly by Government car and partly by ordinary conveyance, we would only slightly modify the rule which we have already proposed. We would lay down that for the first 20 miles of the total journey, or for the whole distance travelled by ordinary conveyance, whichever is greater, a mileage allowance of annas 8 shall be drawn, and for the remainder of the journey a mileage allowance of 6 annas.

Allowances of chauffeurs.

36. We see no reason to alter the existing rule regarding the allowances of chauffeurs.

IV.—Summary of recommendations.

37. To sum up our proposals are as follows :—

(a) That all officers without exception who use Government cars shall pay certain specified running charges, the cost of which we estimate at 5 annas a mile, and that the reasonable private use of a car shall be allowed, subject to certain general instructions.

(b) That the ordinary rules regarding halting and mileage allowance shall apply, with the modifications : (1) that in the case of single journeys by Government car exceeding 20 miles in length only, 6 annas a mile shall be allowed for every mile after the twentieth ; and (2) that in the case of journeys exceeding 20 miles in length performed partly by Government car and partly by ordinary conveyance, 8 annas a mile

shall be allowed for the first 20 miles or for the portion of the journey performed by ordinary conveyance, whichever is greater, and 6 annas a mile for the remainder.

(c) That where a Government car is granted mainly for use at head-quarters the general rule shall be as follows:—

(1) Every officer using a Government car to be classified as "higher-paid" or "lower-paid."

(2) In the case of the "higher-paid" officer, no allowance to be given unless his established annual mileage exceeds 7,000. In the case of such excess, a fixed monthly allowance to be given, roughly representing the extra cost, at 5 annas a mile of the excess travelling.

(3) In the case of the "lower-paid" officer, an allowance of Rs. 60 per unless
litional

(d) As an alternative to the proposals in clause (c) we suggest an experimental system of allowances to officers who use their own cars.

(e) Any fixed travelling allowances given to touring officers to remain unchanged.

(f) Existing rules as to the allowances of chauffeurs to remain unchanged.

V.—Concluding Remarks.

the adjustment of
will be any neces-
ces as suggested by
one of the Local Administrations. It is, however, most necessary again to emphasize the assumptions on which our proposals are based, namely, that a medium-
trained
ure that

satisfied with their bargain.

39. For reasons which the foregoing remarks will explain, namely the doubt which exists as to the efficiency of existing Government cars in many cases, we are
even if adopted for the future, can fairly be
We think it might be left to the Local
report on the present condition of the
whether the new rules should at once
med until the car now in use is disposed
of.

car is
ues to

diminish, it might before long
The single cylinder car is also le
official cars will probably be su
necessary to adapt our various

41. We should not, however, propose to rule out the consideration of two cylinder cars, of which there are some excellent makes in general use. But we doubt

if the difference in cost of purchase and running will be sufficiently large to make it necessary to apply a different set of rules where these cars are purchased by Government. Some cheaper multicylinder cars of adequate size and power are now being put on the market in large numbers, and the advisability of trying them in cases where the conditions are favourable may be worth consideration, after they have been more fully tested in general private use.

J. B. BRUNYATE.
H. G. STOKES.
A. H. O. SPENCE.

APPENDIX A.

NOTES ON SOME TECHNICAL POINTS IN CONNECTION WITH THE WORKING OF MOTOR CARS IN INDIA.

Having completed a tour of investigation which carried me to Bombay, Poona, Madras and Calcutta, I have recorded the results of my enquiries in the following short note, which covers, as far as possible, all the points referred to me by the Committee Owing to the difficulty [illegible] conclusions arrived [illegible] e not so precise as I [illegible] inions, I have been [illegible] Particulars in con- [illegible] ractically unobtainable owing to such devices having, as yet, made very little headway in India. Information on the other points dealt with is the result of my own observation and experience and the opinions of the various experts whose brains I picked I have only been able to record my opinions on [illegible] of them, due [illegible] private owners, [illegible] upply me with figures in connection with the running of their own cars, have failed to fulfil their promises.

Descriptions of various makes of cars inspected.

I have inspected a number of cars of both English and Continental manufacture, and after [illegible] rticulars of those [illegible] is most suitable

(1) Daimler, 15 H. P.—Agents, the Bombay Motor Car Company, Bombay —This car is worm-driven. The worm is slung under the differential. The engine is a four-cylinder " Silent [illegible]

[illegible] the other is that the springs are not strong enough. These two points are, in my estimation, of vital importance.

(2) Fiat 12-15 H. P. (R. A. C. Rating 15 9).—Agents, Bombay Motor Car Company [illegible] ted by a selec- [illegible] oling of engine [illegible] multiple disc [illegible] wheel type of pump. Wheels are artillery [illegible] Control is by accelerator pedal and throttle. Carburetter is of a special make The clearance below the [illegible] The Cardan shaft casing which is continuous forms a very effi- [illegible] are easily accessible. The car, from my own experience, works very well and I am satisfied [illegible]

(3) Siddeley, 12-16 H. P. Car.—Agents, Bombay Motor Car Company.—This car is last season's pattern The engine is four cylinder with cylinders cast in pairs (the 1910 pattern is monoblock) Cooling is by thermo-syphon with large waterways. The radiator is of ample dimensions Magneto ignition only is provided which is capable of advance. Drive is by Cardan [illegible] forced feed by pump. Ground clearance under differential [illegible] very acces- [illegible] what similar [illegible] This is a 14-16 H. P. Sid- [illegible] s. The main difference is [illegible] are of the artillery pattern, [illegible] course, been subjected to the [illegible] lars of this car have already

34 Fin D

(4) 14 H. P. DeDion.—Agents, the Bombay Cycle and Motor Agency.—There are many points to recommend this car for use in India. It is simple, all parts being very accessible, and the finish and workmanship are the best. The reputation of this make of car for reliability is very high. The points which struck me as giving this car a decided advantage over many other makes are :—

(a) Large clearance under the differential which actually measured 12".

(b) The weight of the differential is taken off the back axle by cranking the latter and driving the back wheels by means of miniature Cardan shafts from the gear box which contains the differential and is rigidly fixed to the frame. This should make the car very light on tyres and it avoids all road shocks to the gears. The ignition is by magneto only as is now becoming the usual practice for modern medium-powered cars. The engine is four-cylinder with the cylinders cast in pairs. Inlet valves are mechanically operated. The change speed is by vertical gate giving three speeds and reverse; direct on top. Wheels are 810×90. The car is moderately silent, but it cannot be said that silence is a special feature. The car is provided with a comfortable side entrance phæton body giving accommodation for five. A Cape cart hood is included in the price of Rs.
A glass wind screen would cost Rs. 150 extra. A smaller model of 10 H. P. might be suitable where much hill climbing is not required. It is in all respects a miniature of the 14 H. P. and the cost is very much less.

(5) 12-14 H. P. Charron car.—Agents, the Motor Taxi-Cab Company, Bombay, and Calcutta.—This car has been adopted for the public taxi-cab service. I had the opportunity of inspecting the mechanism of this car most thoroughly. The engine is a four-cylinder with the cylinders cast in pairs. Three speeds and reverse are provided actuated by a selective gate change. Transmission is by Cardan shaft in a crown bevel wheel. The clutch is of a simple leather to metal type. Ignition is by Bosch magento only which gives no range of advance and retard. The car starts remarkably easily. Wheels are 810×90; brakes are all internal expanding type on the counter shaft and driving wheels. Lubrication is automatic by pump in crank case to drips on the dash. The control is by accelerator pedal on throttle. The steering column is quite free of all hand levers. The touring car (photo of which is attached) is provided with a roomy 5-seated body, but the finish is not particularly good. The chassis is strong, but the back driving axle does not appear to be quite as strong as it might be though I have been assured that it has never given any trouble. The clearance below the differential is not to my mind sufficient. The carburetter is a very accessible one, no nuts having to be unscrewed to get at the spray jet. The car is said by the Agents to be very reliable, but I was not impressed by the finish and for several reasons I do not think it is quite suitable for Government use.

(6) 12-16 H. P. Sunbeam.—Agents, Hill Sawyer and Company, Bombay.—This car has an open phæton body to carry five. The engine has four cylinders cast in pairs, cooling is thermo-syphon with a small auxiliary pump for use in the tropics. The ignition is D. R. type of Bosch magneto only. The ignition is fixed. Lubrication is pressure feed by pump and is entirely automatic. There is an indicator on the dash showing if the system is working properly. There are four speeds, direct on top actuated by a gate change selective gear. The reserve is worked in combination with a finger lever on the change speed lever. All valves are interchangeable and are entirely inclosed with easily removeable inspection covers. The fan behind the radiator is provided with a spring jockey pulley to keep the tension of the belt constant. The clutch is leather to metal and has springs under the leather giving very smooth and easy engagement. This can be very easily adjusted without having to dismantle any parts of it. The carburetter is a " Claudel Hobson " which is one of the most satisfactory on the market. The wheels are artillery type Rudge Whitworth detachable and a spare wheel is provided. The control is by foot accelerator entirely as the ignition is fixed and the carburetter entirely automatic. Clearance below the differential is between 9 and 10 inches. Brakes are internal expanding on the driving wheels and external band on the gear box shaft worked by a pedal. I was taken for a long test drive in this car and can speak as to its extreme flexibility and hill-climbing powers. The speed changes can be made without sound, and it is one of the easiest cars to drive. The body work is well-finished and should last fairly well as the panels are metal. The whole car is a thoroughly good piece of work and should prove very reliable. The mechanism is particularly accessible and in this respect is superior to most cars.

(7) 12-14 H. P. Stoewer.—Agents, Hill Sawyer and Company, Bombay.—This is a German car. It has a four cylinder monoblock engine. Lubrication is forced by pump worked off the cam shaft. The valves, which are interchangeable, are completely inclosed with removable inspection covers. The carburetter is a special one of unknown make. The control is by accelerator pedal on throttle and magneto advance lever. The magneto is Bosch type. Fly wheel is provided with blades to increase the cooling of the engine. There are four speeds and reverse worked by a selective gate change. The clutch is of the multiple disc type. A flexible joint is provided between the engine and gear box. All brakes are internal expanding.

Clearance below differential is only 7 to 7½ inches. I was not very much impressed by this car as both the chassis and body showed want of finish. I do not recommend this car for Government *use for the following reasons :—*

(a) Not a well known make.

(b) Finish is not of a high order

(c) *Clearance below car is not sufficient.*

(d) Car is noisy though quite new.

[illegible]

lubrication to the Cardan shaft head and gear box. Brakes on the back wheels are of the internal expanding type and there is a pedal actuated brake on the gear box shaft. Water [illegible]

[illegible] ing this type.

(9) 15 H. P. Napier.—Agents, Messrs Dykes and Company, Calcutta.—This has a four-cylinder engine with cylinders cast in pairs Lubrication is automatic forced feed by pump. [illegible] pedal on throttle and quardrant lever on steering column to same The back axle is very *strong and the whole chassis is well finished and all parts easily accessible*

(10) 12—16 H. P. Siddeley car, 1910 model —Agents, Messrs Dykes and Company, [illegible] Cooling is by [illegible] radiator is of [illegible] n is by Bosch magneto only. Ignition can be advanced or retarded Clutch is of the multiple disc type. Three speeds and reverse are provided actuated by gate selective change Drive is direct on top speed The brakes are very powerful. One is worked by pedal on the gear box shaft and [illegible] sis struck me [illegible] The wheels [illegible] rm is placed [illegible] cut down to the minimum. I had a trial trip on this car and found it very flexible and silent

I *inspected several cars at Messrs. Kilburn's shops at Russa but* as I have already dealt with these types there is no necessity to recapitulate.

(11) 12—16 H. P Renault —Agent, Messrs. Dykes and Company, Calcutta.—I very care- [illegible] try a similar car on the [illegible] forced pump feed to [illegible] an shaft, gear box and [illegible] magneto only and this [illegible] ularly sensitive and the [illegible] sion is by Cardan shaft through bevel crown wheel to the live axle. The control is by pedal on the carburetter throttle and quadrant lever to same fixed on dash Wheels are 815×105. Steering connections are very strong and all parts are well protected. There is ample clearance

The body is of French make and is not well finished. The chassis I inspected and tested was provided with a landaulette body
are very flexible without being too w
ed to me that the speed changes gave
on the sliding rod of the gear lever.
throughout appears to be excellent. I have not been able to obtain any independent opinion as to its reliability when used in this country The car appeared to make more noise than it should do, considering it is quite new.

(16) 14—16 H. P. Belsize (20·3 H. P., R. A. C. Rating)—Agents, Messrs. Oakes and Co, Madras—I have already described this car, a specimen of which I examined at Messrs. Steuart and Company's works at Calcutta. The only difference between the two cars is the method in which the lubrication is carried out In the type shown to me by Messrs Oakes and Company the lubrication is by pump to a glass reservoir on dash and from thence by gravity to the engine. I am not satisfied that this car is very reliable as I can get no particulars as to its performance. It is, however very strongly built if nothing else.

(17) 14—16 H.P. 4-Cylinder Darracq—Agents, Simpson and Co, Madras, 4-cylinder monoblock engine—Lubrication is forced by direct acting pump. Cooling is by pump, direct driven. Ignition is by Bosch magneto only, which does not provide for any advance of the spark. Clutch is leather to metal
speeds are provided worked by a gate chang
Wheels, artillery wood 810×90. This car
in Madras. Prices are given elsewhere.

(18) 12—16 H P. Hotchkiss car.—Agents, Messrs. Simpson and Co., Madras—This car has already been dealt with elsewhere This make of car seems to be well thought of in Madras.

(19) 16 H. P. Vauxhall car.—Agents, Messrs the Madras Automobile, Limited, Madras.—This car is provided with a 4-cylinder monoblock engine Cooling is by thermo-syphon *with large waterways.* Valves are interchangeable and entirely enclosed by inspection lids held by thumb screws The clutch is metal to metal internal cone type giving no end thrust on engine. There is a universal joint between the engine and gear box. Three forward speeds and reverse are provided actuated by a selective gate change. Ignition is by high tension Bosch magneto, timing of which can be advanced.

cation is positive forced feed
ansmission is by Cardan shaft
e gear shaft and hand applied
Wheels are 810×90. The cars

The agent informed me that a Government officer, with whose name he supplied me for reference, drove a Vauxhall car of this type from Ootacamund to Madras *viâ* Bangalore at a duty of *23 miles to the gallon.*

Although I inspected many other cars of different makes than those dealt with below, I have not thought it worth while to record any notes in connection with them, as they did not satisfy the required conditions, being either too high or too low in horse power, too expensive or embodied some feature, or features, which militated against their successful use in the tropics

Of the cars which I have inspected and tested I select the following which I consider are the most suitable for Government purposes.—

(1) Renault.
(2) Talbot.
(3) Sunbeam
(4) Napier
(5) Berliet.
(6) Fiat.
(7) Siddeley.
(8) Hotchkiss.
(9) Vauxhall

These cars I have placed in what I consider their order of merit. Probably the first five or six cars noted are really of equal merit, and I should explain that my choice has been governed, partly by the reputation they have for reliability in this country, and partly by a consideration of the various points in regard to finish, accessibility and general design. I have not taken into consideration the question whether a particular car is of English or *continental* manufacture.

There is no "best car" now-a-days, and in the selection of a particular make the personal equation is liable to form a large factor. In this connection the following notes supplied by Mr. Vincent, Captain Willis, R. E., Mr. Oakley and Mr. H. B. Pierce have particular application.

Note by Mr. Vincent of the Bombay Police.

Starting on the assumption that a four-cylinder internal combustion petrol motor is the accepted type, the first consideration is the question of cost, the second whether the car should be of British or of foreign manufacture, the third the limitation of H. Ps. With reference to cost, cars may be roughly divided into three groups. The high-priced and as a rule, high-powered car, the medium priced, medium-powered car and the cheap (and unsuitable or nasty) variety.

As an indication of the first class may be mentioned the names Napier, Daimler, Panhard Fiat, Mercedes, Rolls Royce—names familiar to every motorist as representing the best quality, finish and material in English, French, Italian and German motor construction. We may couple with these the Berliet, Delauny, Belville Talbot, Hotchkiss, Itala, La Buire and some others. The home catalogue price of the smallest four-cylinder model of any of these cars complete with side entrance body, hood, lamps and headlights would in most cases exceed (in some cases considerably) £500. To this must be added packing case, freight, insurance and a few necessary spares. The cars would presumably enter free of customs duty and no doubt a considerable rebate would be obtained by direct orders in quantities. Both these factors would favourably influence the actual price of the cars landed in India. It is because Indian prices are so unstable depending to a great extent on agents' profits and type of models sent out that this note deals with English list prices. If then a high-priced car is being considered no better selection can be made than the 15 H. P. colonial model Napier. His Highness the Maharaja of Gwalior is in possession of a 1910 pattern of this type and information could thus be obtained first-hand of constructional details, running and general suitability.

Turning to the question of the country of manufacture no reasons need be adduced in the case under consideration, for confining one's choice to a car of British manufacture, though this term must be interpreted broadly, for even the trade will admit that it is practically impossible to give a full guarantee that all parts of the British car, including steel forgings in the rough, ball bearings, oilers, plugs, coils or magneto are of British manufacture. There is no doubt that the French, the Germans with their Mercedes and Benz and the Italians with their Fiats led the motor car trade some year back, but we have every reason to congratulate ourselves on the fact that we have caught up this unfortunate lead and that cars of British manufacture can now hold their own against any and every foreign type. One or two good cars of Belgian make have for this reason not been considered and cars of American manufacture have been entirely eliminated. Apart from the fact that the early American cars, first the steamers, then the old mobiles which flooded the markets, were enough to prejudice any intelligent observer, the cars of the present day, such as the Ford, and even the Cadillac with its many "talking points" of accessibility, interchangeability, enormous output, hence cheapness of construction and ultimate price, are as unconvincing to the mechanical mind as they are frail to look upon. Though they are a class above the American "bug about" retailing at about £100, they cannot be compared to the British medium-powered and priced car on points of solidity, sound engineering construction and general design of engine, chassis and body.

Turning now to the British-built medium-powered and priced car we have quite a large choice and plenty of scope for purposes of comparison when we mention such cars as the Siddeley, Vauxhall, Belsize, Alldays, Bell, Sunbeam, Vulcan, Star, Argyll, Humber and others. These firms all build models of 14 to 16 H. Ps. and have been sufficiently long in the motor trade to ensure of their keeping up to date in such broad principles of construction as High Tension Magneto ignition, clutch, steering brake and body design.

Their list price complete with hood and lamps work out at from £350—450. The low-powered and cheap car need not be discussed here. There are a number of good little single cylinder, twin cylinder and even a few four-cylinder cars on the market, the Swift, the Phœnix, the Riley amongst others, but they have not the requisite power necessary for a district official's touring car in India.

The last few paragraphs will have given an indication of the H. Ps. requisite for the car under consideration. This, with a modern four-cylinder engine and a modern, hence reasonable light body, should not be less than 12 and need not exceed 16.

The maker's figures should be compared with the figure arrived at by the R. A. C. formula and by the Dendy Marshall formula, *viz.*, $\frac{D.2 \times S. \times N.}{12}$

A modern 15 H. P. car will do all that is wanted. It will run comfortably at an *average* pace of 20 M. P. H., it will carry four passengers, give sufficient leg room and still leave space for storing some kit. Such a car will do most of its work on top speed and climb ghauts

such as the Mahableshwar one comfortably on the second. In other words *the engine is sufficiently powerful and flexible to allow of comfortable driving at reasonable speeds, without strain on engine or driver.*

Without proceeding to a critical elimination of cars which do not come up to standard *it will be well* to consider certain points in motor car construction which are either accepted standard practice or of special interest in India.

The question of ball bearings has been a point of much contention, but it appears now to have become more or less recognized *practice to have no ball bearings in the* engine and to employ roller, cone or ball bearings on the wheels only. All things considered and looking to the satisfactory work of the plain bearing the latter seems indicated for India. Balls *will* break, there will be difficulty in replacing them and a scored ball race is not easily replaced.

Thrust ball bearings are required on the bevel drive, but their functions are different, and they are not subjected to such heavy strains

Gear box.—Three speeds and reverse as fitted to most modern cars is all that is wanted. The top speed should naturally be direct and the gate change is finding favour more and more, though this is of minor importance With a 15 H. P engine four speeds are unnecessary. A 4th highly-geared indirect speed may be advantageous for racing, but is totally unnecessary in a touring car.

Chain driven cars are practically obsolete. Despite their mechanical advantages, the disadvantages attendant on exposed chains and the noise of this form of drive has resulted in almost universal adoption of the live axle driven through a Cardan shaft. The latter fitment requires study.

An efficient type of universal joint, capable of proper lubrication to the front and rear of the gear box, is a *sine qua non*. The drive through the Cardan shaft should be as straight as possible, a factor which at present is not, as a rule, the case in worm-driven live axles thus detracting from the merits of the latter system.

Brakes.—The footbrake which is more frequently used should act on the back wheel drums, *the side lever brake on the brake drum to rear of the gear box, thus reserving this* geared up and powerful braking system for its true use, namely, in case of emergency.

Too much attention cannot be paid to the lubrication system, provision should exist for the oiling of such frequently neglected parts as spring shackles and steering joint connections.

As regards the oiling system for the engine, standard practice tends more and more towards a *positive forced feed system to the abandonment of the unreliable gravity or* exhaust pressure feed and splash lubrication, hence the oiling system requires *to be carefully* noted.

Ignition.—High tension magneto is practically standard practice and cannot be superseded for efficiency and reliability.

Many cars are still fitted with a dual ignition system, the coil and accumulator forming (*a*) an efficient reserve in case of breakdown of the magneto, (*b*) facilitating starting, (*c*) allowing of self-starting within a reasonable period when once the engine has been run and warmed up.

These appear on the face of it to be solid advantages, but are in reality negligible when considering a car for district work in India. Of course the first question that will be raised is what will you do if your magneto breaks down. The only answer to this is that the modern H. T. magneto is so reliable *(and fool-proof) that it is practically immune from breakdowns* and that if it did the chances are 100 to 1 against the battery system being in order. Accumulators require much care and delicate handling and to remain efficient want constant use without complete exhaustion and *constant recharging*. These conditions cannot be applied to a *reserve* system of ignition or to *accumulators in most parts of India*.

Dry batteries suggest themselves as a suitable alternative, but dry batteries have a knack of being run down when wanted and cannot be looked upon as reliable.

As for the fallacy that magneto ignition means difficult starting, this has been exploded in the last few years. A H. T magneto of modern construction starts the engine on the first or second turn every time; if it doesn't start we can safely look for the fault elsewhere, probably in the carburation.

Self-starting is delightful in town driving or with constant stoppages, *it is* an unnecessary luxury in a touring car.

If these facts are admitted there is no reason to install a dual ignition system, the H T. magneto satisfying all needs. There are a number of good H. T. magnetos on the market.

and I believe the best firms generally supply such few spares as may be required as well as a good illustrated reference book. But a magneto ought to require no adjustment for two or three years.

A point which requires attention is the method of driving the magneto. To do so with an exposed chain is a makeshift, a magneto ought to be coupled directly on to one of the shafts of the enclosed 2 to 1 gear.

As the question of the 2 to 1 gear has been touched on, note may be made of the noiselessness of the same. A number of cars are built with fibre and gunmetal, spur wheels which contribute towards silent and smooth running.

The question of cooling is of the utmost importance in India, but a fact which is often not understood is that the internal combustion engine is more efficient the hotter it runs. The difference between an engine which has its water just *below* boiling point and therefore is working at its best efficiency and an engine which boils its water away and *then* overheats is not sufficiently appreciated. The thermo-syphon system is finding more and more favour at home, and a large number of modern cars are running in India on this system giving complete satisfaction.

An efficient type of radiator with a larger water capacity is naturally fitted on colonial models. and if a car with thermo-syphon circulation is selected the question of its efficiency should be the subject of test under ordinary Indian working conditions including a lengthy climb on the second speed.

The Belsize 14—16 and 20—30 models give complete satisfaction in this respect.

An efficient thermo-syphon system is in every way preferable to pump circulation with its attendant troubles of leaking glands, extra piping, gearing, etc.. loss of power and liability to break down.

Body.—The modern side entrance body fulfils all requirements of a district officer, doors to the front seats add greatly to comfort. A detachable tonneau sounds ideal for district work, but such a fitment means extra expense, and if the rear seats are not to be used but kit is to be stored, the side entrance body gives ample storage room. *The body must be metal-pannelled,* wooden pannelling cracks and warps and will not stand the climate or rough usage.

A Cape cart hood with side curtains should be a standard fitment.

A glass wind screen is not necessary.

The question of clearance must be considered, some cars are built too low for anything but smooth roads, and though a district officer does not, or should not, take his car off metalled roads excessive camber and a big stone in the road might spell ruin with a car of low clearance.

The question of clearance is connected partly with the size of wheels.

Wire detachable wheels, such as the Rudge Whitworth, are strongly recommended for India. Wooden wheels are not as strong and the spokes shrink in the hot weather, thus requiring tightening and packing from time to time.

Detachable wheels, with a spare wheel and tyre, practically eliminate the trouble caused by punctures and bursts with its attendant waste of time on the road.

The largest and heaviest tyres which the rim will take should be stipulated for as this spells comfort and economy in the long run.

Clutch.—The old leather cone clutch is as satisfactory as any. The multiple disc clutch, though delightfully sweet, wants considerable attention. The Belsize have a metal to metal clutch of extremely simple design which gives a very smooth action and requires practically no attention.

A point for consideration in the selection of a car as a standard pattern for use in India is to firstly settle on a firm which is not of the mushroom type, which has survived the tight market of the last few years, which has not constantly changed its patterns, which has not gone in for freak cars or exhausted itself in building racing types and which has, if possible, stood the test of one of its type as public service vehicles. Secondly, choice should fall on that car which appears to be best value for money with a high ton mileage per gallon.

Reverting now to paragraph 2 and assuming that the high initial cost of the first class puts them out of the question the following cars in the medium-priced class appear to meet most of the particulars enumerated above. The reputation of these cars is as varied as their number, and there is no car built which has not its detracters just as there is no car of known inferior make and quality which under favourable conditions has not given entire satisfaction to its enthusiastic owner.

The order of merit in which cars of the second class should be placed is therefore one open to much discussion, it must be remembered that first considerations are low initial cost, suitablity of the standard type, economy in upkeep and proved efficiency of the firms standard type in India. Hence the many adherents and admirers of the 12—16 Siddeley will understand, though not necessarily appreciate, why they do not figure at the top of the list. *The prices marked are approximately taken where possible from latest* advertisements in Motor papers :—

		£
1. Belsize 14—16 Torpedo body detachable wire wheels	.. .. ..	315
2. Vulcan 15, 9, 1911 model touring car	.. ..	315
3. Siddeley 12—16	.. . .	370
4 Alldays 14—18	.. ..	325
5. Talbot 15 H P.	. .. .	460
6 Argyll 15 H. P.	.. . .	350
7. Star 15 H P.	.. . .	315

Humbers have gone through so many vicissitudes that they have been omitted from the list, so have Darracq who constantly change their patterns, also Brown, a foreign built up car, Cadillacs, about the best of the American productions, and a host of others which begin to verge on the cheap and nasty variety. Omitting No. 5 the Talbot, which really belongs to the first division, but which in quality can hardly compare with Daimler, Mercedes, etc., it will be seen that the price works out at about £340 on an average.

Upkeep.—This is the most important item which the motorist has to face The 60 H. P. car of a few years ago running about 8 miles to the gallon and 1,000 miles to a set of tyres has practically disappeared off the market. A car of the class under consideration should comply with the following conditions :—

It should run 20 miles to the gallon year in year out, in other words when tested it should top 25.

It should be economical in lubricating oil and easy on tyres.

The wear and tear of tyres is so intimately connected with the method of driving, the care taken of them, the weight carried, climatic conditions, etc., that it is impossible to estimate the life of tyres. It may, however, be calculated that a set of 4 tyres will be required per annum, 5,000 miles being the total covered in the year.

The following figures may be of assistance.—

20—30 4-cylinder Belsize 1908 pattern petrol consumption driven in Bombay including the rainy season and much city work.

1,100 miles for 76 gallons or 14 miles to the gallon.

Special test 170 miles which included a straight away run of 80 miles.

Petrol consumed 11 gallons or 15·3 miles per gallon.

Engine lubricating oil 300 miles per gallon.

Ordinary lubricating oil 500 miles per gallon.

Tyres, front, continental, rear heaviest Kempshall that rims would carry Front tyres were old stock and rubber is a little hard. *Distance run 2,000 miles. Back tyres, bought* partly as an experiment in economy, distance run 1,300. Tyres show no undue wear and ought to last 4,000 miles which will be average annual mileage of this car in Bombay These figures give a very fair idea of recurring expenditure. It must be remembered that they refer to a 20—30 H P. of a 2 years old pattern A modern 15 H P. would improve by 20 per cent. on these figures.

In calculating upkeep, insurance should be taken into consideration. Repairs it is impossible to estimate for.

E. D. Vincent,

Indian Police, Bombay.

Notes recorded during an interview with Mr E J Oakley, Messrs Kilburn and Co, and Secretary to the Automobile Association of Bengal

Mr. Oakley on being asked to name a few makes of cars in the order of their suitablity for use under Indian conditions noted the following —

Renault	.. . .	8 H. P. 2 Cylinder
Ditto	.. ..	10 H. P. 4 „
Ditto	.. ..	12—16 H. P. 4 „
Ditto	.. ..	14—20 H. P. 4 „
Siddeley	.. ..	14 H. P. 4 „
Sunbeam	.. ..	15 H. P 4 „
Napier	.. ..	15 H. P. 4 „

He considers that the Renault car is all round the most suitable make for use in India and that it is quite in a class by itself.

Wheels.—He considers wire wheels have a great advantage over the wooden artillery type. He is strongly in favour of detachable wheels with a spare wheel in place of a Stepney rim. He considers that detachable rims have the disadvantage that they must be removed, cleaned and greased at short periodical intervals, otherwise when in the ordinary course of running it becomes necessary to change a rim it may be found that the spare rim will not go on, on account of rust. He considers that the Riley and Rudge Whitworth detachable wheels are satisfactory.

With regard to the size of wheels, he is strongly of the opinion that the largest diameter of wheels that the makers will fit and the largest section of tyre that will go on these rims will be found the most satisfactory from all points of view. He places the ideal minimum of section as 100 m. m.

He considers that assuming the maximum weight of a car is 25 cwt. and the minimum section of tyre 100 m. m., the back wheel tyres should be pumped up to a pressure of 75 and the front wheel tyres to a pressure of 50 to 60 pounds per square inch respectively.

Cooling.—Mr. Oakley is satisfied that when a modern car is provided with a properly designed system of thermo-syphon circulation of the cooling water with large waterways and easy bends a pump is an unnecessary complication.

Ignition.—Ignition by means of a good high tension magneto of the Bosch type is in Mr. Oakley's estimation quite satisfactory. There is absolutely no difficulty in starting on the magneto if the carburetter is giving the proper mixture. Accumulators are difficult to get charged in out-of-the-way places and dual ignition may be considered an expensive and unnecessary luxury.

Transmission.—Mr. Oakley is in favour of the Cardan shaft driving a crown bevel in the back axle. He considers that the worm drive has not yet been sufficiently tried in India and the replacement of a broken worm would be an expensive and difficult job unless a special plant were installed for cutting it.

Speeds.—In a hilly district four speeds would be an advantage, but under ordinary conditions three speeds are quite satisfactory. The selective change speed gear working in a gate is not a necessity, though it is perhaps more "fool-proof" than the run-through type in the hands of an inexpert driver.

Clutch.—Plate clutches of the multiple plate type are ideal when they are in thorough order, but they require a lot of looking after and special oils have to be used for their lubrication.

The DeDion single plate type of clutch is thoroughly reliable and does not require to be lubricated. Mr. Oakley considers that there is nothing superior to a leather clutch of the internal type, which puts no end thrust on the crank shaft. Such a clutch gives practically no trouble, requires very little attention and gives a very smooth engagement.

Brakes.—Brakes should be of the internal expansion type properly protected from dust and wet. Mr. Oakley is of opinion that when possible the pedal should actuate the back wheel brakes, as it is the most used and, when the pedal works the brake on the gear box shaft, it puts an undesirable strain on the gears.

Life of Tyres.—Mr. Oakley considers that the life of an outer cover (excluding the element of luck in the matter of punctures) depends to a great extent on the driver of the car. In Calcutta it has been found that the fabric of outer covers rapidly deteriorates during the rainy season and this deterioration is, to a great extent, independent of the mileage run by the car. It is his experience that, as a general rule, it is not worth while to retread a cover from which the rubber has disappeared with fair wear and tear. He considers that the life of a tyre cannot be taken at more than 4,000 miles. The element of luck, however, enters so largely that it is quite possible that a cover may be worn out after doing quite a small mileage and, on the other hand, it might last more than double the distance mentioned.

Reinforced inner tubes have not proved an economical success so far as Mr. Oakley's experience goes. Canvas liners have, on the contrary, been found a complete success. Studded tyres are not desirable on a medium-weight car on the score of expense. They rapidly lose their steel studs, as a rule. They are, in the case of heavy cars, a practical necessity to prevent side slips if no other anti-skid devices are used.

Consumption of Petrol.—Mr. Oakley considers that given a 12—16 H. P. modern car of good make if 18 miles to the gallon are not got out of it there is something wrong,—probably more to do with the morals of the driver than with the carburetter. In town driving where the consumption of petrol must, of necessity, be greater than when the car is used on open district roads the consumption should in no case exceed one gallon to 15 miles.

Lubrication.—Mr. Oakley considers that for the medium-powered car, automatic pressure feed by pump to sight feeds on the dash is probably the most satisfactory. He does not think that a car should use more than a gallon of good lubricating oil for every 500-miles run.

Overhaul of car.—A car should, Mr. Oakley considers, be thoroughly overhauled, say after every 15,000 miles run. This means taking down the engine, gear box, differential, etc., completely and renewing all worn parts.

Cost of repairs.—Mr. Oakley cannot offer any useful opinion on this point, as so much depends on use or frequently misuse that the car has been put to. A great deal also depends on the charges of the repairer.

Running charges.—It is impossible, so Mr Oakley is of opinion, to give any reliable figures as so much depends on the way a car is driven. He gives as a rough standard to be worked up to ½ an anna per H. P. per mile. (This does not include depreciation).

Notes recorded during an interview with Captain Willis, R E

Captain Willis considers that nothing over 16 H. P (calculated according to Warby Beaumont's tables) is required for any car purchased for Government use unless it is required to work under [illegible]

fitted for use in the tropics, and that if the opinions of a number of experts were canvassed it would be found that they varied very considerably on the subject

Captain Willis named six cars which he placed in the following order of merit :—

Maker.	Number of cylinders.	Dimensions of cylinders.	Price of		Remarks.
			Chassis.	Car with 4 or 5 seated body.	
			£	£	
1. De Dion Boulton ..	4	66×120	*295	..	*These prices will be slightly enhanced if the long chassis which is recommended be selected.
2. Do. ..	4	75×120	*370	..	
3 Talbot	4	80×120	350	385	
4. Renault	4	80×120	..	..	This year's dimensions. No figures available for 1911 These cars are very expensive
5. Vulcan	4	80×120	215	295	
6. Metallurgique ..	4	75×110	325	370	

Captain Willis considers that there is nothing objectionable about the monoblock engine as he has not seen many cases of scored cylinders, and such a contingency is remote if anything like reasonable attention is given to the car

On being asked his opinion about the Sunbeam car, he said it used to have an unenviable reputation for over-heating, but this remark only applies to makes of three years back

Captain Willis does not consider the underslung type of worm gear drive is suitable for use under ordinary conditions in this country as the clearance below the differential is dangerously small.

Captain Willis recommends the largest wheels and tyre sections to be used. He places the minimum for a 12-16 H P car at 810 × 100 m m. He prefers the Sankey type of all metal wheel to the wire one He is not altogether in favour of detachable wheels on account of possible damage to the car during removal and the constant care they require to prevent rusting He considers that there is no particular objection to the use of a Stepney wheel with a moderately light car.

On the subject of cooling Captain Willis expressed the opinion that given a modern car of good make, the cooling system, whether by thermo-syphon or by pump circulation, is pretty sure to be satisfactory.

Though he prefers accumulator ignition with Lodge coil he appreciates the difficulty that would be experienced in getting accumulators recharged in out of the way places and therefore, the high tension Bosch type of magneto ignition is a necessity, and may be considered satisfactory.

Captain Willis considers that the transmission should be by worm and wheel or crown bevel. The former, for choice, if the bevel is placed above the back axle. Chains as a means of transmission are quite out of date. He considers that three speeds are sufficient for all ordinary requirements, and that the selective gate change, which is now generally adopted, is probably the best as it is more "fool-proof." Captain Willis is strongly in favour of the Hele Shaw type of multiple disc clutch when in expert hands, but it requires special lubricant and careful attention, and for this reason, the DeDion type of single plate metal to metal clutch, which is run dry, is preferable for use by expert drivers. The internal cone leather faced type of clutch is also very reliable and requires very little attention.

Captain Willis considers that the mileage life of a tyre, when used in Calcutta, cannot be taken at more than 3,500, but a great deal depends on luck. No tyre independent of the mileage run will, as a rule, last over more than one year. The canvas foundation rapidly rots during the rain, no matter what care is taken of the cover.

Petrol expenditure is a matter which depends largely on the driver, and Captain Willis considers that 18 miles to the gallon is the minimum duty, that should be expected from a 12-16 H. P. car. If the curburetter is properly adjusted, a duty of 22 miles to the gallon should easily be secured on good roads.

His own 8 H. P. Rover has run 516 miles on 13 gallons of petrol which works out to 42 miles to the gallon.

Captain Willis considers that when an ordinary native driver is kept it is advisable to have a thorough workshop overhaul after the car has run 10,000 miles.

The life of a car depends primarily on the treatment accorded to it. But no matter how carefully handled it may be, each part will fail ultimately through molecular change in the materials due to the vibration. Failures on this account need not, however, in his opinion, be anticipated at a less mileage than 50,000 in the case of any first-class car. With normal use this would allow about 10 years' life of a car.

After 5 years, however, the car would be out of a date, new parts would probably be difficult to obtain from the makers and even thorough overhaul at frequent intervals would not prevent the car being noisy and probably inefficient. Seven or eight years would, in his opinion, be sufficient to allow for the extreme life of a car, and it should then be sold for whatever it will fetch.

Tyres should be very carefully looked after if they are to last for any reasonable time. It is essential that cuts should be dealt with at once as the attack of moisture on the canvas in this climate is very rapid. It may be said that the cause of the destruction of a tyre in this country is invariably failure of the canvas. It is very seldom one sees a tread more than slightly worn. Tyres bought in the country are very seldom fresh, and he considers that that is one reason of the rapid failure. The rubber very soon cracks in these old tyres and admits water to the canvas through the minute fissures, which are often invisible from the outside. It would be better if all tyres were imported direct from home sealed up before export in tins with some flowers of sulphur in the tin. They must be absolutely fresh when sealed up.

All good modern cars are suitably braked. The advent of the front wheel brake is the only new feature of interest. It is without doubt a great help in the avoidance of skidding and might advantageously be fitted to cars intended for use in the large towns, especially Calcutta and Bombay. Some are averse to having the foot brake applied to the driving shaft for fear of straining the differential on the bevel drive. Captain Willis on the contrary uses that brake in preference to the brakes on the back wheels as the foot brake, working through the differential, applies exactly equal braking effect to both wheels and so saves tyres.

The compensating devices on the back wheel brakes only truly compensate when the friction of all the leads, whether wire or rod, on both brakes happens to be exactly equal on both wheels. It is practically impossible for this ideal condition to occur. Differentials, bevel, and worm gears are in these days made amply strong enough to withstand the effect of braking through them.

Notes taken during an interview with Mr. H. B. Pierce, Secretary to the South India Motor Union.

Mr. Pierce on being asked which make of car (English or Continental) he considered to be the most suited for use in India give it as his opinion that most really first-class cars would be thoroughly satisfactory if they were treated properly, and that the life of a car rests chiefly in the hands of the driver. Mr. Pierce informed me from his experience that under conditions prevailing in Madras not more than 20 miles to the gallon of petrol can be expected from a 15 H. P. car. On the subject of wheels, Mr. Pierce is strongly in favour of those constructed of steel, whether of the wire type or of the artillery shape pressed steel wheel, as he has seen many cases of failure of the wooden artillery type of wheel due to shrinkage. Steel wheels can be repaired with comparative ease, which is not usually the case with artillery wooden wheels.

Mr Pierce did not consider he was in a position to state the probable mileage life of a tyre. The element of luck entered so largely into the question that it was impossible to give even a rough approximation.

He is not able to state difinitely which is the best make of outer cover for use in India.

ciency to which the thermo-syphon system of cooling has been brought, there is no necessity to introduce the extra complication of a pump into the circulation.

The following are the quotations for the nine cars above mentioned :—

1. *12-16 H. P. Renault*—The Renault car is, to my thinking, the one which is best suited for use in India. The careful workmanship, extreme simplicity and accessibility, and the undoubted wearing qualities which it possesses makes it an ideal car for those parts where facilities for repairs do not exist. I have had many opinions of experts, who have in every case spoken well of them. I specially quote Mr. MacCabe, Chief Engineer to the Calcutta Municipality, who has had considerable exper [illegible] uding the Renault. [illegible] nt use. The only [illegible] almost invariably occurs in the fulfilling of an order.

Price quoted by Messrs. Dykes and Co, Calcutta, for 12-16 H P Renault Car.

	Rs.	A.	P.
Price of chassis including all charges	6,250	0	0
" " locally made body	1,000	0	0
" " " " hood	250	0	0
" " " " wind shield	120	0	0
Set of side lamps and one tail lamp	100	0	0
Extra for five detachable Rudge Whitworth wheels	375	0	0
" " 815×105 tyres instead of 810 × 90	175	0	0
Total	8,270	0	0

Messrs. Kilburn and Co. give practically the same quotation.

2 *15 H P. Clement Talbot Car.*—This is a strong and powerful car and holds a very excel- [illegible] or use in India. I have not [illegible] ountry. It is more expensive [illegible] a much more powerful car and is of equally superior finish. Messrs. Kilburn and Co quote the following price for the car .—

	Rs.	A.	P.
Price of chassis including all charges	7,100	0	0
" " locally made body	1,000	0	0
" " " " hood	250	0	0
" " " " wind screen	120	0	0
" " three lamps	100	0	0
To this should be added the price of a Stepney wheel, say Rs. 75	75	0	0
Total	8,645	0	0

There is a smaller model of this car of 10-16 H P. (13 9 H P, R A C Rating)

	Rs.	A.	P.
The cost of the car as above would be complete	6,700	0	0

This model would probably be sufficiently powerful for all Government purposes

3 *12-16 H. P. Sunbeam*—Price quoted by Messrs Kilburn and Co —

	Rs	A.	P
Price of chassis including all charges	5,550	0	0
Locally made body	1,000	0	0
" " hood	250	0	0
" " wind screen	120	0	0
Set of three lamps	100	0	0
Extra for five detachable Rudge Whitworth wheels	375	0	0
" " 815 × 105 tyres	175	0	0
Total	7,550	0	0

This is a very well-finished car and should give excellent service in India. I have heard it well spoken of in Bombay.

4. *15 H. P. Napier Car.*—Special colonial type. Messrs. Dykes and Co., of Calcutta, quote the following prices:—

	Rs.	A.	P.
Price of chassis including all charges	6,532	0	0
„ „ locally made body	1,000	0	0
„ „ „ „ hood	250	0	0
„ „ „ „ wind screen	120	0	0
Set of three lamps	100	0	0
Total ..	8,002	0	0
Add for Rudge Whitworth wire wheels	375	0	0
Add for extra large tyres	175	0	0
GRAND TOTAL ..	8,552	0	0

I can offer no opinion about this car, as I have not had the opportunity to inspect it, but, judging by other models of the same make, it is safe to assume that it is quite up to any car on the market so far as quality of materials and workmanship are concerned.

5. *12-14 H. P. Berliet Car.*—The French Motor Car Company, Calcutta, quote the following price for this car—

	Rs.	A.	P.
Complete with their own locally made body, hood and wind screen and provided with two acetylene head lamps, two side lamps, one tail lamp, milometer, Stepney wheel and Horn.	6,750	0	0
Add extra for Rudge Whitworth detachable wheels (five)	375	0	0
Add for extra large tyres 815 × 105 instead of 760 × 90	175	0	0
Total ..	7,300	0	0

This car is well made and seems to be popular with private owners out here. A special colonial model at the same price having increased clearance under the car can be supplied at the same cost.

6. *12-14 H. P. Fiat*

Price quoted by the Bombay Motor Car Company—

	Rs.	A.	P.
Price complete with English body	4,425	0	0
Add import and other charges	900	0	0
„ hood (English)	300	0	0
„ screen „	150	0	0
Total ..	5,775	0	0

(Lamps are included in the above as well as the usual equipment.)

No quotation was given for Rudge Whitworth wheels, but it might be taken as in

	Rs.	A.	P.
other case at	375	0	0
and for extra large tyres as	175	0	0
	550	0	0
which brings up the total to	6,325	0	0

This is a very cheap car for the price, and is making great reputation for itself on Bombay side.

7. *12-16 H. P. Siddeley Car.*—Agents, Messrs. Dykes and Company, Calcutta—

	Rs.	A.	P.
Price of chassis including all charges	5,500	0	0
„ „ locally made body	1,000	0	0
„ „ „ „ hood	250	0	0
„ „ „ „ wind screen	120	0	0
Lamps	100	0	0
Extra for five detachable Rudge Whitworth wire wheels	375	0	0
Extra for 815 × 105 tyres instead of 810 × 90	175	0	0
Total ..	7,520	0	0

Price of the same car quoted by the Bombay Motor Car Company—

	Rs.	A.	P.
Price of car complete with touring body including three lamps ..	5,475	0	0
Extra for freight, packing, duty, insurance and landing	930	0	0
Add for English hood	300	0	0
" " English wind screen	120	0	0
*" " Rudge Whitworth wheels..	375	0	0
" " 815 × 105 tyres..	175	0	0
Total ..	7,375	0	0

* The two last items were not quoted by the Bombay Motor Car Company.

8 *Hotchkiss' 12-16 H. P.*—Price quoted by Messrs. Simpson and Company, Madras—

	Rs.	A.	P.
Car complete with English built body, standard artillery wheels, hood and wind screen and three lamps.	7 250	0	0
Add for five Riley detachable wheels including tyres 815 × 105 ..	650	0	0
Total ..	7,900	0	0
If with locally manufactured body, etc.	8,150	0	0

This quotation is much higher than that given by Messrs. Steuart and Company of Calcutta, which follows :—

	Rs.	A.	P.
Price of chassis including charges..	5,260	0	0
" " locally made body	1,000	0	0
" " " " hood	250	0	0
" " " " wind screen	120	0	0
Lamps, say	100	0	0
Extra for 815 × 105 tyres	120	0	0
Total ..	6,850	0	0
If with five Rudge Whitworth detachable wheels	720	0	0

9. *16 H. P. Vauxhall Car.*—Agents, Messrs. The Madras Automobile, Limited.

Quotation of prices supplied by the Agents—

	£	s.	d.
Price of chassis	330	0	0
Case and packing	9	0	0
Freight and insurance	20	0	0
Import duty	20	0	0
Wind screen	10	10	0
Hood	12	0	0
Body (including lamps)	45	0	0
Total ..	446	10	0
=Rs.	6,690	0	0
	Rs.	A.	P.
Extra for Rudge Whitworth wheels	375	0	0
Extra for tyres 815 × 105	285	0	0
(Difference (on 4 tyres) between 810 × 90 and 815 × 105 and one new 815 × 105 tyres with tubes.			
Grand total ..	7,350	0	0

A large number of reports have been received from the various officers who are in charge of [illegible] little use [illegible] car can be [illegible] mileage [illegible] useless for purposes of comparison. In a good number of cases approximate figures have been supplied of the mileage run; but very little reliance can be placed on these figures, as it is a most difficult matter to guess, even remotely, the distance run unless it is over well-known roads.

I have frequently been surprised, when in England, at the difference between my estimated journey and the actual distance as subsequently arrived at by measurement of the route on the map.

I have very briefly reviewed all the reports below, and the only conclusion I can draw from them, as a whole, is that the cars have been very badly used and that seldom has any attempt been made to secure even moderate economy in running. We cannot always expect a high economy in the running of Government motor cars, the drivers, as a rule, being ignorant and having no apparent interest in reducing expenditure. I would invite special notice of the fact that the car used by His Honour the Lieutenant-Governor of Eastern Bengal and Assam has been worked very economically, and this result is probably due to a properly qualified man on good pay being employed as driver.

12 H. P. Argyll motor car in charge of the Officiating Deputy Inspector-General of Police, Presidency Range.

Here we have a definite figure for the mileage run by the car, and so can get some idea as to what the petrol consumption was per mile, though the separate cost of the petrol and lubricants has not been noted. The lubricants cannot well have exceeded one gallon to every two hundred miles (probably it was very much less), which would give roughly 3 gallons for the distance run. Taking the cost of Rs. 5 per gallon, we get Rs. 15 as the cost of lubricants. The cost of petrol would be Rs. 201—15=Rs. 186, and supposing the cost of petrol at Calcutta to be Re. 1-2-0 per gallon, this would mean 165 gallons, therefore miles per gallon=4·28. This shows that either the figures given are wrong or that the petrol must have been used for some other purpose than that of driving the car. It is incredible that any car of 12 H. P. seating only 2 should use up one gallon of petrol for each 4¼ miles run. Such a car if well tuned up, should do 25 miles per gallon. The figure for renewal of tyres is also very excessive, as it works out to a little more than Rs. 0·35 per mile. The sum of Rs. 1,396 spent on repairs and replacements is very heavy, working out to Rs. 1·97 per mile. Unless this charge was for repairs due to an accident it is quite unreasonable. Judging by the figures supplied and accepting them as correct, this car should be put out of work, until it is overhauled by an expert as the cost of running it shows that it is in a deplorable condition.

10-12 H. P. Argyll car in charge of the Commissioner of the Patna Division, Bengal.

This car has had very little use as a mileage of 3,000 is not much for even one year's work. The car must have been very badly treated indeed to have worn out after having travelled such a short distance. The cost of petrol and lubricants has not been separated. Taking the consumption of lubricant at a maximum of $\frac{3,000}{200}$ = 15 gallons and the cost at 15×5=Rs. 75, we are left with a balance of Rs. 640 for petrol. Assuming the price of petrol to be Re. 1-2-0 per gallon we arrive at a total of 569 gallons and $\frac{3,000}{569}$ = 5·27 miles per gallon. This result is very poor and must be due to ignorance or carelessness in the use of the car by the driver. The cost of renewal of tyres is not by any means high, working out to only Rs. 0·048 per mile. This is no doubt due to the low mileage run. The total cost of working the car comes to Rs. 2·22 per mile, which is very heavy. It should, however, be noticed that the heaviest items of expenditure are those of establishment, which cover over 36 per cent. of the total charges. The Commissioner expresses an unfavourable opinion as to the suitability of this make of car for Government use.

10-12 H. P. Humber car in charge of the Commissioner of Police, Rangoon.

No estimate of the mileage run has been supplied, so it is impossible to express any opinion as to whether the cost of running it is excessive or not. All that can be gleaned from the Commissioner's communication is that the car has been a most unsatisfactory investment, and that it has shown excessive wear in parts which give little or no trouble during the life of an average car, which points towards bad material or faulty workmanship.

12-15 H. P. Humber car in charge of the Superintending Engineer, 1st Circle, Buildings and Roads Branch, United Provinces.

Nothing can be gained from the Superintending Engineer's report, as no actual figures in connection with the running of the car are furnished.

15 H. P. Humber car in charge of the Chief Engineer, Public Works Department, Buildings and Roads Branch, Punjab.

Nothing can be gained from the figures supplied, as the mileage has not been given. This is another case in which the Humber car has not given satisfaction.

15 H. P. Coventry Humber car in charge of the Commissioner of the Orissa Division.

The rough approximation of the mileage is hardly sufficient on which to base any analysis of the performance of the car. Accepting the figures, however, and the Commissioner's estimate of a petrol consumption of 10 miles to the gallon, the total amount of petrol comes to

$\frac{6,000}{10}$ 600 gallons costing Rs. 610 (excluding the cost of lubricants) The cost per gallon therefore works out to only Re. 1 (approximately) per gallon which seems a little low for Orissa. The car appears to have given fairly satisfactory work, and the tyre expenditure is not, so far as can be ascertained from the incomplete figures, very excessive. The total cost of running the car works out to Rs 0·346 per mile which cannot be considered excessive.

15-20 H. P. Coventry Humber car in charge of the Commissioner of Lucknow.

The figures supplied in connection with the car are of no value as the mileage run has not been even approximately noted. The car is said to be a good one, but that it is inclined to over-heat. This is probably the result of a badly adjusted carburetter as I know private owners of this make of car who have not experienced any trouble of this nature.

10-12 H. P. Beeston Humber car in charge of the Deputy Inspector General of Police, Behar Range, Bankipore.

This car is said to be rather too small for comfort and not powerful enough for hill climbing. [illegible]

10 H. P. Swift car in charge of the Collector of the 24-Parganas.

Nothing can be gained from the figures supplied as the mileage run has not been given. The car has not worked satisfactorily and was continually breaking down.

8 H. P. Darracq car in charge of the Commissioner of Police, Calcutta

From the figures supplied this car has done most excellent service as the charge for running it works out to only Rs 0·067 per mile, which is an exceptionally good result but seems too good to be true. The cost of lubricants and petrol only comes to Rs. 0·017 per mile Taking the cost of petrol at Rs. 1-2-0 per gallon (not taking the cost of lubricants into account) we get a duty of 67 miles to the gallon which seems to be an impossible figure

8 H. P. Swift car in charge of the Director of Industries, Madras.

The figures supplied in connection with this car are not sufficient to allow of any analysis [illegible] r will, although the compression is not [illegible] h doubt. On the whole the Director's [illegible] well advised to purchase another car of a similar type.

15 H. P. Humber motor car in charge of the Principal, Bengal Veterinary College, Calcutta.

In this case only a very approximate figure for the mileage run has been given and so any figures based on the mileage have not much practical value The Humber car has not, so far as I have been able to gather, generally proved to be reliable in India though I can quote several [illegible]

as the mileage run is merely an assumed figure, we may, for the purpose of arriving at some rough approximation of the consumption of petrol per mile, assume that the lubricants work out to not more than ½ gallon per 100 miles —and putting the cost of oil at Rs 5 per gallon (a fair average) $\frac{13\,140}{200}\times 5$ represents the cost of the lubricating oil =Rs. 328, the cost of petrol therefore comes to 1,880—328=1,552 and taking the cost of petrol at Re 1-2 per gallon the number of gallons works out to 1,379 nearly and the mileage per gallon comes to $\frac{13\,140}{1,379}$ =9·5 miles. This is very low, but it must be taken into account, that nearly the whole of the driving was done in crowded Calcutta streets where there are continual slow-ups and that street driving always means very heavy petrol consumption. Still if the figures for mileage run are in any way approximate, this is a poor performance. The cost of tyre renewals is Rs. 2,779, which works out to Rs 0·21 per mile This is not so bad considering the car had been used by officers learning to drive

[illegible]

and general conditions in India better than the ordinary rubber and canvas or cord tyres and that none of the various types of protective bands and steel studded tyres have been proved to have any real economical value. *The conclusion arrived* at by the Principal on the subject of

mistries is certainly sound. Unless the owner of a car is himself an expert on the subject of motors, it is very bad policy to employ any but an expert mechanic to look after it and a thoroughly trained mechanic cannot be got without paying a fair wage which will depend on the local labour market. The Principal suggests that there ought to be a Government-maintained repairing garage in Calcutta, the where officers could take their cars for repairs and advice. This proposal is hardly feasible owing to the small number of cars, owned by Government. Such a project might perhaps be entertained if the numbers largely increased in the future.

Neither does it appear possible to organize a corps of Government drivers for the same reason. Taking it altogether the letter from the Principal gives me the idea that the car has been more sinned against than sinning. A Humber car will give satisfaction when in the hands of a thoroughly competent driver who is a skilled mechanic, but it is liable to give trouble unless it is very carefully used, and such being the case, it is not suitable for a Government officer who has usually neither the time nor the inclination to look after it.

10-12 H. P. Argyll car in charge of the Commissioner of the Presidency Division, Calcutta.—No figures have been given of the mileage run by this car, so it is impossible to express any opinion on its performance. The car is said to be in fair working order though noisy after more than four years' service.

10-12 H. P. Darracq car in charge of the Commissioner of Excise and Salt, Bengal.—No figures of mileage run have been supplied, so it is impossible to get any idea as to the petrol consumption per mile. The charge for repairs appears to include the cost of renewals of tyres.

20 H. P. Renault car in charge of the Commissioner of the Tirhut Division.—The figures submitted by the Commissioner are of practically no value as it is impossible to say what the cost of running the car per mile comes to. The only thing that strikes me about the figures is the excessive charge for accessories which works out to nearly 1·8 time, the cost of renewals of tyres. The cost of petrol is given as Rs. 144, and taking the cost per gallon at Rs. 1-2-0 (which is the local price) the quantity works out to 128 gallons. The petrol consumption for a 20 H. P. car is not likely to exceed 18 miles to the gallon, so that under the most favourable circumstances the mileage could nat have exceeded 2,304 miles (when the car was used on tour). The cost of renewals of tyres comes to Rs. 0·16 per mile and the accessories work out to Rs. 0·28. The petrol works out to Rs. 0·062 per mile and the other charges included under the heads "chauffeur's wages, minor repairs, replacements, and repairs of a special nature" work out to 0·36 of a rupee. The total therefore gives 0·16+0·28+0·62+0 28=Rs. 0·7 per mile run, or Rs. 0 11. The Commis ioner is said to pay about Rs. 60 a month for petrol for his private use of the car. Taking the period during which the car has been in use as 17 months and the average cost of petrol as Rs. 60, we get an expenditure for the period of 17×60 =Rs. 1,020 which, at the rate of 18 miles to the gallon, works out (taking the price of petrol as before Rs. 1-2-0 per gallon) to 907×18=16,326 miles. This appears to me to be an impossibility as I know that the car is not used for any long private journeys. I do not think therefore that any conclusions can be drawn from the figure supplied. All that can be said for the car is that it has worked extremely well under very severe conditions, which have conclusively proved its reliability and suitability for use in India.

10 H. P. Clement Talbot car in charge of the Superintending Engineer, Western Circle, Bengal.

I am not sure that the figures supplied can be altogether correct, as, taking the mileage run, the cost of petrol and the mileage per gallon given by the Superintending Engineer, we get the following approximate cost of petrol per gallon for each year :—

	Rs.
1907-08	1·3
1908-09	0·43
1909-10	1·12
1910-11	1·2

The rate for 1908-09 appears to be impossible. The miles per gallon shown for 1909-10 and 1910-11 are respectively 15·65 and 16·8, which compare very favourably with those of most of the other Government cars, of which we have got figures. Over rough and hilly roads this cannot be called a very bad performance. The cost of tyres is not excessive in the light of our experiences with other cars. The Superintending Engineer is satisfied with this make of car, but, judging from the late experience with a similar car in charge of the Superintending Engineer, Central Circle, Calcutta, I should say it is under engined and the gears are decidedly weak for such a heavy car. The Superintending Engineer's recommendation that Government motor cars should be provided with wire wheels is sound, and the same opinion has been expressed by nearly every owner or user of a motor car, whom I have consulted on this piont. The recommendation contained in the last paragraph of his report is well worthy of careful consideration.

16-25 Arrol Johnson car in charge of the Commissioner of the Fyzabad Division.—The

much better than that of some other Government-owned cars. The cost of lubricants comes to $\frac{449}{13,600}$= Rs. 0·033 per mile which is quite reasonable. The cost of tyre renewals works out to Rs. 0 13 per mile. Taking into account the fact that the car was used in famine works, which generally means bad roads and very rough treatment, I do not think the results can be considered anything but satisfactory. The cost for repairs to the car is quite reasonable considering that it included the cost of an overhaul. I should say that this car had worked in a very satisfactory manner and has proved itself very reliable. Careful driving and an expert adjustment of the carburetter would probably very much decrese the consumption of petrol per mile run.

7. H P. Oldsmobile car in charge of the Commissioner of Police, Howrah.—No indication of the mileage run by this car has been given, so the figures supplied are of no practical value.

1907-08, and

he charge for

res could not,

This would

mean that seven new tyres were purchased during the years specified. The Oldsmobile has not got much of a reputation in England for reliability, and second, hand cars of this make can be picked up there for £ 20 as I know from my own personal knowledge.

10-12. H. P. Clement Talbot car in charge of the Deputy Inspector-General of Police, Burdwan Range.

This car has not been used very much as the total mileage for three years only amounts to 1,981. The cost of th

ing to over 8 annas per m

into account the cost

2·2 miles per gallon. A

put out of work immediatley until it is thoroughly tested by an expert. The repairs to tyres and renewals of same comes to Rs 313, which works out to Rs 0·17 per mile which is not very heavy.

The car is a good one though under-engined and such poor results must be due to misuse of the car.

The suggestion contained in the penultimate paragraph of the Deputy Inspector's letter is a good one, but not feasible as the Seebpore College authorities have informed me that they do not undertake the repair of motor cars or the instructing of drivers

14 H P. Clement Bayard car in charge of the Commissioner of Police, Bombay.

Figures regarding the mileage run by this car are not available, and so it is impossible to say whether it is economical to work or otherwise. The type is not sutiable for Government use for the reasons noted by the Commissioner of Police. The Commissioner's remarks regarding the capabilities of the Siddeley and Napier cras deserve attention. What he has to say on the subject of wheels is very much to the point, as also his reference to the necessity for adequate clearance below the car.

16 H. P. Siddley car in charge of the Deputy Commissioner of Lucknow.—The figures available are not sufficient to allow any conclusion to be drawn regarding the efficiency and economy of the car. The car is of an out-of-date pattern and the petrol consumption is said to be about 10 miles to the gallon. A driver and cleaner on low pay are maintained.

to be Rs. 1,120—Rs. 312=Rs. 808, and assuming the cost of petrol to be Rs. 1-2-0 per gallon we get the quantity of petrol consumed to be 718 gallons. The number of miles run to the gallon works out on this basis to a little over 17, which may be accepted as fairly satisfactory. The cost of renewals to tyres has not been quoted fully and so no definite conclusion can be arrived at on this point. The car is apparently a good one, and though underpowered it has evidently done satisfactory work and has not given trouble. The chauffeur is a highly paid

maintenance charges being so low. The Albion

not come across any of them

14-20-H. P. Vickers Maxim (Siddeley) car in charge of the Executive Engineer, Presidency District, Bombay.

The cost of petrol worked out to Rs. 247 and the commercial rate of petrol is stated to be annas eleven a gallon (the ordinary market rate is Re. 1 per gallon), therefore the number of gallons of petrol consumed was 358, the mileage run was 6,480 which works out at a duty of a little over 18 mile per gallon. This is certainly a good result if much of the driving has to be done in the crowded streets. The renewal of tyres was not a heavy item as it works out to only Rs. 0·125 approximately. The sum of Rs. 912 was the expenditure incurred on 4 Kempshall tyres and inner tubes 815×105 M. M. The Executive Engineer makes an allowance of Rs. 180 per annum for carrying out a general overhaul and repainting and revarnishing every two years, which is a practice to be commended as it tends greatly to increase the life of a car. The total cost of the running the car works out at 0·34 per mile. The petrol cost is very low, and if the cost was Rs. 1-2-0 per gallon, which seems to be about the average rate for India, the cost of running the car would have been increased to Rs. 0·36. It will be noticed that the cost of petrol does not seriously affect the cost of running a car as it forms only a small item compared with the total charges. The results of running the car may be considered very satisfactory. The Executive Engineeer was fortunate with his tyres as he only had to renew four of them in the course of a year which is, from my enquiries, rather below the average.

8-10 H. P. Clement Talbot car in charge of the Superintending Engineer, Central Circle.

This is a two-cylinder car, which is, I consider, underpowered.

The cost of petrol is for the two years reviewed Rs. 613, and the cost of petrol is about Re. 1-1-0 per gallon which works out to 577 gallons. The distance run is given as 7,000 miles which works out at a rate of slightly over 12 miles per gallon. This does not at first sight appear to be a good performance, but it should be remembered that this car is practically entirely used in the congested streets of Calcutta and that this entails running on the lower gear for a large part of the time or standing with the engine running. The probability is that if the car was tested on a continuous run on a fair road the petrol consumption would be greatly reduced. The cost of lubricants works out to Rs. 0·024 per mile which is very reasonable. The cost of tyres was heavy in the year 1909-10, and works out in that year to Rs. 0·36 per mile, but the average cost for the two years is Rs. 0·137 per mile. Mr. Fennimore has expressed his opinion that the life of a tyre used on a car running in the streets of Calcutta does not average twelve months. The climate during the rainy season has a very deleterious effect on the canvas of the tyre, which rots even though it may not have otherwise been injured by cuts, punctures, etc. This is also the experience of Mr. MacCabe, the Chief Engineer to the Calcutta Corporation, and Mr. Steuart Menteth, an experienced motorist of Bombay, also expressed the same opinion in regard to the life of a tyre used in Bombay.

Consumption of petrol per mile run.

On the question of the average consumption of petrol which should be expected from a 12-16 H. P. car, I see no way to arrive at any definite conclusion based on the figures in connection with Government cars which are at our disposal. The condition of the roads, weight of the car and the number of passengers usually carried are all factors which greatly influence the mileage which can be done on a gallon of petrol. From persual of the "Autocar" and various other motor publications, it seems to be the generally accepted opinion that a 12-16 H. P. modern car should run at least 20 miles to the gallon over give-and-take roads in England. I attach a few cuttings from the motor papers which were taken at random and which bear out the above statement.

"Autocar," August 13th, 1910.

No. 1427.—20 H. P. Model T Ford Car.—In answer to above, I will try and reply to the questions *seriatim*. I would say that the car is absolutely reliable, and as a doctor I can always rely upon keeping appointments punctually. The car is very nice as a touring car, for it is so light and easy on tyres, punctures are a very rare event, and the wear is very slight on the treads, and the car itself is so simple to drive, no gear changing being required. As to whether this Model T is going to wear well, it is early days yet, and the improved 1910 Model T has not been on the market long enough to answer that question. I have had a Model N for two years, and both in upkeep and wear it has more than fulfilled my expectations. One of the original tyres (Dunlop grooved) is still in use after 15,000 miles (speedomotor, not guesswork) and has not been retreaded. I average between *twenty and twenty-five miles to the gallon of petrol* in this hilly country ; oil about one pint per 100 miles. So far, the car has run 2,300 miles since the end of May. Practically speaking, the whole of the driving is on the top gear. The other week, with four up, we easily negotiated Mucklow Hill outside Birmingham at Halesowen on the top gear twice. As it so happened I had to stop dead on the hill for traffic, and then went back into top gear. With regard to renewals, everything can be obtained from London per return, and the depôt will always send down a skilled mechanic at an extremely moderate charge.

For instance, the clutch needed a little tightening (not unusual in a new car with similar plate clutch). I wired at 11-30 ...
London after 6-
including railwa
can do oneself by following book of instructions.—BERTRAM ADDENBROOKE.

"Autocar," August 6th, 1910

No. 1419. 12-16 H. P. 1910 Sunbeam.—After having had three months' experience with

roads

If your correspondent will order 810×100 grooved Dunlops instead of the 810×90 plain

...h or spare wheel should be fitted with steel studs in case of greasy roads being encountered in the winter. In ordinary times studs on the driving wheels are unnecessary.—A. J. MONTGOMERY.

"Autocar," August 20th, 1910.

No 1427. 20 H P. Model T Ford Car —I had had a four-seater Ford car since June 1909, and in that time I have travelled 14.720 miles On one occasion only has the car ...

blacksmith's tools—no replacements I have made many long trips, among them being a four-

in London, and find her admirable in traffic I have made thirty-three miles to a gallon under very favourable circumstances, but my average is between *twenty-eight and thirty* Oil consumption (roughly) is about 250 miles to a gallon, but this varies accerording to the kind of work the car is doing For ordinary work a gallon lasts 300 miles. I got eleven thousand miles out of one back tyre without a puncture, and seven thousand out of one Continental studded back tyre. I drive and look after my own car, and I am not in any ways conneted with the Ford Co —G S.

"Autocar," August 6th, 1910.

RUNNING COSTS

[15899] This subject is always of interest, and as I have just disposed of an 8- H. P. Rover four-seated car after running it for three years and two months, the following account may be interesting to many of your readers .—

	£	s	d
Repairs and adjustments and spares	36	19	4
Petrol, oil, and accumulators charging	33	11	7
Tyres, tubes, and vulcanising	40	18	5
Insurance, tax, license, and club subscription	35	5	3
	146	14	7

Riding of Yorkshire, but the car has taken us about most parts of the country between Carlisle and Bournemouth —W. C. A.

RUNNING COSTS.

...ntion was called
Mr Herbert E.
Shepperd, who is
his own chauffeur so far as driving and adjustments are concerned, writes that, having possessed his 14 H. P. Alldays for twelve months, he felt that the firm might like to know how the running cost had worked out over that time, seeing that the smallness of this total made it particularly

interesting. The figures do not include any item for garage or for depreciation. Mr. Shepperd puts the year's run at 8,000 miles, and the fuel consumption at 382 gallons, which is equal to 20·9 miles per gallon. His petrol appears to have cost him a shade over 1s. per gallon. The various totals given are as follows :—

	£	s.	d.
Petrol (382 gallons)	20	9	9
Oils and grease	3	17	8
Taxes, insurance, and license	15	1	0
Cleaning materials	0	9	4
Repairs	2	2	6
Plugs and spare springs	1	7	3
Tyres	20	13	1
	64	0	7

It will be seen that this works out at 1⅞d. per mile for a car capable of seating five persons, the above mileage including a tour of 1,000 miles in one week through Devonshire and Cornwall. The figures show what can be done with a car of this class and power, and answer questions regarding cost of upkeep which are very frequently put to us. The man who buys a car of this kind for pleasure, and desires to know what it will cost him to run, wants just such figures as these, and does not, as a rule, consider that he should take garage rent into consideration when he has car shelter of some sort attached to his own premises.

"Autocar," August 27th, 1910.

No. 1443. 12 H. P. Rover.—I have driven a 12 H. P. Rover for some time, and have three friends driving similar cars. We are all owner-drivers, and have not experienced any trouble. I recently toured part of North Wales, and resolved to test the petrol. The Jones spedometer gave the distance 224 miles, and the car had consumed exactly seven gallons of petrol. This works out at just thirty-two miles per gallon. The engine is very well balanced, and runs very smoothly and quietly. The car is a good hill-climber, and the engine brake is most useful in traffic and causes economy in tyres. "Essex Calf" will regret buying a 12 H. P. Rover.—V. R.

I drive a 15 H. P. new Daimler (1910), on which I have now done over 2,000 miles in six weeks, including a tour to Scotland, during which we drove 1,006 miles on forty-one and a half gallons of petrol, which works out at an average of twenty-four and a quarter miles per gallon. Upon some of our "flat" journeys we averaged, I believe, quite twenty-seven miles per gallon, but on certain portions of hilly and bad road (by Barnard Castle and Ulleswater to Penrith, for instance) we did considerably less, and thereby reduced our average to twenty-four and a quarter throughout the tour, which average is, in my opinion, a good one, and speaks well for the car. The car carried throughout the tour three people, a lot of luggage, wind screen, hood, spare wheel, etc. My late car, a 14-20 H. P. Wolseley-Siddeley (1909) averaged twenty-two miles per gallon throughout fourteen months' constant driving.—VIATOR.

No. 1442. Petrol Consumption.—I have had a 1905 Napier since October 1906. When it first came it did ten miles to a gallon. First, I set the timing of the spark to coincide with the piston just over the top centre at dead retard. Secondly, I set the float needle to get the petrol level with the top of the jet by moving the needle up and down in the collar till the right level was found. Thirdly, I gave the engine all the extra air it needed. My car always runs with the extra air port wide open. I find the car runs best on Shell, and is now doing twenty-five miles to a gallon, having tried both Pratt's and Carburine. The car did not come direct from the Napier works to me but through an agent, and was second-hand. The roads round here (Galashiels) are by no means level, and sometimes there is a lot of hill-climbing, even with three up and luggage.—1905. NAPIER.

"Autocar," September 24th, 1910.

No. 1479. B. S. A. Cars.—I have driven a 2,533, B. S. A. landaulet for two years covering 20,000 miles, and never had a mechanical stop. It will do forty miles an hour at its best, and take almost any hill on third speed. I overhauled the engine last winter, and the only trace of wear was on one gudgeon pin; all the other parts were as good as new. It has one of the best gear boxes I ever saw in a car. It did seventeen miles per gallon of petrol and 600 miles per gallon of lubricating oil. The front tyres would do 5,000 to 7,000 miles, but this car was sadly undertyred on back wheels, as the back tyres always blew out at a little over 2,000 miles. It was the best car and gave the least trouble of any I ever drove.—H. F. H.

"Autocar," September 10th, 1910.

No. 1443., 12 H. P. Rover.—I have a 12 H. P. Rover two-cylinder car. I recently toured Norfolk, doing just over 400 miles without having to lift the bonnet, and the other day I did Great Yarmouth and back, a distance from Clapham Common of 260 miles, on a petrol consumption of nine gallons, which works out at twenty-eight miles to the gallon. This, with three people in the car besides myself, I venture to think is something of a record.—A. E. DE LACY.

I have owned and driven one of these cars since Christmas, 1908, having done most of the hilly parts of Yorkshire and Derbyshire with four up, and never found any difficulty in mounting them, nor ever
are on now th Three of the tyres
reports giving epney. I notice
five. If " Ess ge about twenty-
any way intere pin. I am not in

No. 1455 Petrol Consumption.—If " H P T "
of card, say 1 m m , and run with the ext
the seat under *ordinary conditions*, I thi
to the gallon on average roads This has
valve lever on the dash two or three not
equally well with either ordinary or ·760 petrol —S. J. REYNOLDS.

In India when driving on *kutcha* roads we cannot expect to get as good a duty and when the *kutcha* roads are moderately good a duty of 18 miles to the gallon may be considered fairly satisfactory. The Indian Motor Taxi-Cab Co in Bombay informed me that they average 100 kilometers to 15 litres which works out to very nearly 19 miles to the gallon. The Executive Engineer, Presidency District, Bombay, ran his 14-20 H. P. car 6,480 miles at an average

ditions, should not exceed 1 gallon to 18 miles. Captain Willis, R.E., considers that the consumption of petrol is a matter which depends largely on the driver, but that 18 miles to the gallon is the minimum duty which should be accepted from a 12-16 H P. car My own opinion is that better results than these could be secured by very careful driving and accurate adjustment of the carburetter, but these two conditions are ot likely to be fulfilled while comparatively inexpert drivers are employed.

Taking into consideration the above figures and the opinions referred to, it is evident that a standard of 18 miles to the gallon is by no means impossible to attain, and certainly when the

REPAIRS.

I have carefully
bay, Calcutta and Ma
a speciality of repairs
but they are not equipped for carrying out all kinds of repairs and they certainly are not in a position to manufacture parts such as gear, wheels, cylinders, pistons, etc. They say that by keeping a sufficient set of spare parts there is no necessity for arranging for their manufacture which would cost very much more There is a lot of truth in this, but at the same time unforeseen contingencies do occur and portions of cars do break of which no spare parts have been stocked, and it is then that the value of the completely equipped shop becomes evident. I enquired from the Sibpur College authorities as to what facilities they had for carriyng out repairs to motor cars, but they replied that they did not undertake such work. The French Motor Car Company have a fairly well-equipped workshop, and I saw them carrying out all kinds of repairs even to the casting of new cylinders and the cutting of gear wheels. I was not able to discover whether their charges were reasonable, but it is presumed they must be, or they would not be able to compete successfully, as they appear to be doing with the older and more thoroughly equipped establishments in Calcutta The French Motor Company are prepared to carry out all repairs and replacements of every kind to both the machinery and bodies of motor cars. From the specimens of work which I inspected I am satisfied that they employ first-class skilled labour and good materials. The best and most completely furnished workshops for the repairs to the machinery of motor cars are undoubtedly those of Messrs. Kilburn and Co at Russa Here we find the most up-to-date automatic machine tools and a most complete equipment for dealing with every kind of repair work to the chassis of a car. I inspected many specimens of work in progress and am satisfied that bad or indifferent work has no place in these shops. This firm does not undertake the repairs or construction of bodies, but confine themselves entirely to the chassis and tyres. The arrangements for dealing with the latter are very complete and are under the direction of an expert from home. I went into the system of charging for repairs with the Manager, and from actual inspection of the books it was made clear to me that excessive charges are not possible. The charges are

based on the workmen's time and the materials issued. After a job is completed credit is given for any materials in excess which remain over. If cars are obtained through this firm and petrol and lubricants are obtained through them, they will make a reduction on their charges for repairs. It should be kept in mind that it is much cheaper to get spare parts out from England than to have them specially manufactured in India. Whenever it has been decided what particular make of car is to be selected a list of the spare parts which ought to be kept in stock should be prepared and this complete set of spare parts should accompany the first car which is imported. The first cost will be heavy, but it will be found to be an economy in the end. It is a question for the Committee to decide if firms should be selected in Bombay, Calcutta and Madras through whom cars should be imported. Whatever firm is selected they should be made to give a guarantee to keep certain spare parts which would be supplied at English prices *plus* charges for import and carriage.

I inspected the repair shops of Messrs. Oakes and Co., Madras. They have a small workshop where they carry out repairs to motor cars and motor bicycles. I cannot say that it is well equipped with machine tools, but they can carry out all repairs within the scope of an ordinary lathe and they have a gear-cutting attachment with which they can cut spur wheel teeth, but they have no automatic machine for this kind of work and so the cost of gear-cutting must be rather heavy. This firm have been appointed as official repairers to the South of India Motor Union. They have a foundry elsewhere in Madras where they can carry out all castings required. I was not favourably impressed by the capacity of the workshops for carrying out heavy repairs. Mr. Pierce, who is in charge of the P. W. workshop in Madras, took me over them and showed me all the different departments. These shops are in position to do all repairs, of whatever nature, to motor cars and are sufficiently equipped with machine tools to undertake the replacement of any broken parts and to cut gears of any pitch. No facilities for the repair of rubber tyres exist, nor would it be worth while to install the necessary plant, unless there was a prospect of a large number to be dealt with, which could not be the case with Government-owned tyres and there might be an objection raised against the carrying out of repairs to privately-owned cars and their rubber tyres on the ground of interference with local industries.

Messrs. Simpson and Co. of Madras have motor repair and body building workshops which can deal with most repairs in connection with motor cars. These consist of machine shop, foundry, smithy and body-building shop. This firm build the bodies for most of the cars which they import, and I certainly think that the specimens which I inspected are quite on a level with anything I have seen turned out in India. Aluminium only is used for the panels of all their locally constructed bodies on account of its non-rusting properties. The wood used in the framework is carefully selected and the workmanship is distinctly good. The shops are quite extensive and can deal with all ordinary repairs, and gear-cuttting within limits can be carried out.

This firm stock spare parts for all tyres, Darracq cars and also for the 12-16 H. P. Hotchkiss car. The spares which I inspected comprised all those that are usually required.

Messrs. Addison and Co. of Madras have a small workshop attached to their garage which is fairly well provided with machine tools which can deal with all ordinary repairs to the chassis of a motor car. They can cut spur gears within ordinary limits. The shop is under the supervision of an expert mechanical engineer from England who appears to thoroughly understand this class of work. I saw several specimens of work being carried out in quite a creditable way. A department for the dealing with repairs to rubber tyres is attached to the workshop and all kinds of repairs, including complete re-treating of tyres, can be carried out. Specimens of repair works which I inspected were distinctly good. A fairly complete vulcanising outfit is maintained.

The Principal of the Thomason College, Roorkee, has informed me that their shops are equipped with all the machinery required for any kind of repair work to motor cars, except gear-cutting, and that he is prepared to deal with all cars brought along for repairs.

There are Public Works workshops at Bombay which are in a position to cope with repairs to motor cars, but they have not, so far, undertaken any work of this nature. The Sibpur College of Engineering have intimated that they do not undertake the repairs to motor cars. Several Government officers have expressed their opinion that Government should establish a garage and workshops where repairs could be carried out at a much less cost than that which would be charged by the local firms who undertake this class of work. The following three extracts, which deserve consideration, are noted here for easy reference :—

Deputy Inspector of Police, Burdwan Range, remarks.—I venture to suggest that it would perhaps be a saving in the long run if Sibpur College started a class and undertook yearly the overhauling of all Government cars in the same way that the Government Dockyard deals with Government launches. I am inclined to think that the charges of Calcutta firms are exorbitant.

Superintending Engineer, Western Circle, Bengal—It appears to me that it would amply

Colonel F. Raymond, F.R C V S , Principal, Bengal Veterinary College, Calcutta—In my opinion there should be a repairing garage belonging to Government in the central part of Calcutta to which officers could take their cars for repairs and advice. For, I fear, there are untrustworthy garages in Calcutta and the honest firms are to my mind excessive in their charges. There should be touring Inspectors of Machinery who would make unexpected visit and overhaul the car and report the result to the officer in charge and to head-quarters

The Public Works workshops at Madras and Bombay and the Roorkee College are, as has already been noted, prepared to take up the repairs to Government cars. The Sibpur College at Calcutta would cause a great s[illegible]
for carrying out repairs to motor [illegible]
dering that this is a Government [illegible]

Special steels would have to be imported for use by the Government workshops in renewal of [illegible] f change speed gear boxes, etc. [illegible] engines and the renewal of the [illegible] Most gear boxes, road wheels [illegible] tained quite cheap in the Eng- [illegible] to try to manufacture them [illegible] ured article would never come up to that turned out by firms who make ball bearings a speciality A small stock of these to suit the special car or cars usually brought in would have to be kept.

LAMPS.

As a rule the lighting of a car by electricity is not feasible in India owing to the difficulty experienced in getting accumulators charged. Even when facilities for recharging are available, it is more expensive than acetylene gas or paraffin It is not worth while taking into consideration the various systems of electric lighting by means of self-contained plan such as the C. J. L "Magnelolite," C. A. V., H N, or Bleriot, etc., which are worked direct from the engine of the car, as they are complicated and require expert attention to keep them in running order For the mofussil, when a car is not being much used after dark, I would strongly recommend th[illegible] which have been found quite satisfactory when moderate speeds o[illegible]
is really [illegible]
candle power, and is as simple as an ordinary oil side lamp to keep in order I have seen these lamps in use and am satisfied as to their efficiency when speeds of 15 to 20 miles per hour are not exceeded. The price is very moderate compared with acetylene lamps but whereas [illegible] The best self- [illegible] Road Duplex, [illegible] quite sufficient [illegible] Lucas acetylene duplex lamp would be about Rs 198 in India and the cost of the two [illegible] projectors would be Rs. 200. The first cost is slightly in favour of the acetylene head light, but the cost of working the paraffin lamps would be very much less When a car is to be used in a Presidency town it would perhaps be advisable to have a pair of acetylene head lights with a separate generator. There are many good combinations on the market and from enquiries I have made I find that the Rushmore are largely used and have given satisfaction. The cost of two head lights of moderate size with a separate automatic shaking grate generator would be roughly Rs 180.

There is a self-contained acetylene head light called the "Dreadnaught" which I saw in use on a private car. The light was very steady and I was informed that the lamp was very satisfactory The cost was said to be Rs 98 in Calcutta A "Powell and Haumer" self-contained acetylene head light which I inspected while in use was said to be very satisfactory. It appeared to be very well made and was giving a good steady light. The cost was, I was informed, £75 purchased through an Agent in Calcutta.

For side lamps I think that none could be more satisfactory than those of Lucas's make, but I cannot speak from experience of others except the Salisbury which is a good reliable make; and the price is moderate. The cost comes to about Rs. 25 each in Calcutta Of tail lamps there

are a number which seem to be equally satisfactory. From my own experience I have found the " Dependence " which I obtained from Messrs. Gamage, London, to be thoroughly reliable under all conditions. The price in England was, I believe, 15s. which would probably be Rs. 20 out here.

Insurance.

The question whether Government-owned cars should, or should not, be insured is one on which opinions seem to be fairly divided. It is not quite clear why Government should insure a motor car any more than any other piece of property owned by it. I have not come across a single case in which Government has taken out a policy of insurance with any Insurance Company for a steamer launch, portable engine or any similar piece of property. In addition to insurance covering damage to the car the risk of third party claims has to be taken into consideration. An officer cannot reasonably be held responsible for any claims preferred by a third party due to an accident caused by a car in which he was driving, or being driven, when engaged on his legitimate duties. If Government is not prepared to execute a policy of insurance with a public company covering accidents to the car and third party claims, then some allowance should be made in maintenance charges to cover those risks. The charge made by Messrs. Shaw, Wallace for insurance covering damage to car and third party claims comes to 3¼ per cent. of the value of the car, and if a public company can do this Government should be able to reduce the rate of the premium considerably.

The only firm which appears to make a regular business of motor car insurance out here, so far as I have been able to ascertain from local enquiries, is Messrs. Shaw, Wallace and Co., Strand Road, Calcutta. Other firms no doubt do insure cars, but, as Messrs. Shaw, Wallace appear to be the firm which has done the bulk of this business, I have taken their policy as a type and attach their proposal form for easy reference. The terms offered do not include injury to lamps or tyres, nor, outside a Presidency town, do they include carriage of the car to and from the place where it has to be sent for repairs. As there was some ambiguity in regard to what would be paid on a car after several years' service in the event of its total destruction. I made careful enquiries on this point with the following result. If the firm does not insist on reduction of the premium on renewal of the policy by reducing the value of the car by what they consider a fair allowance for depreciation, they will pay the full amount for which the original policy was executed. The third party claim is payable any number of times for each separate accident up to a limit of Rs. 3,750 for each accident when the annual premium is Rs. 200 and over.

No claim below Rs. 50 will be paid.

In the case of a car costing Rs. 8,000 when purchased, the annual premium would be Rs. 260.

Comparing this with Lloyds AA Policy on a car of similar value and of 14 H. P. (the firm above quoted does not take H. P. into account) we should have to pay Rs. 236 approximately which covers unlimited third party claims and damage to car including lamps and tyres. These terms appear to be more favourable, but then the risk of damage is not so heavy in England as it is in India where rules regulating the traffic are so universally broken.

Wheels.

Most of the cars which I had the opportunity of inspecting were under-tyred, and for use in India I would suggest nothing less than 815×105 m.m. =32″ × 4¼″.

This conclusion is the generally expressed opinion of all the owners and users of cars whom I have consulted on the subject. By using large tyre sections there is not the necessity for pumping up the tyres to the same pressure as would be the case in smaller sections, and this greatly reduces the risk of bursts due to expansion under high temperatures. I have consulted a large number of experts on the question as to whether wooden or wire wheels are the most suitable for use in India and the consensus of opinion is greatly in favour of the wire wheels. Two well-known car agents, who build their own bodies, informed me that they are continually getting cars sent to them to have the wooden wheels tightened up, the spokes having become quite loose in the course of a single season. This usually necessitates complete reconstruction of the wheels with Indian materials. The explanation is that no wood out of which wheels are constructed in England is subjected during its seasoning to the extreme desiccation which it is subject to in India, and that even the best and most thoroughly seasoned English woods undergo a further shrinkage when they are exposed to the excessively dry conditions, which obtain during the Indian summer. Another point greatly in favour of the wire wheel is its capacity for standing shocks and distortion which would completely destroy a wheel of the wooden artillery pattern. Also in case of damage a wire wheel can be easily repaired, whereas a wooden wheel generally requires complete reconstruction. The only disadvantage attached to the wire wheel appears to be the difficulty in cleaning it, but in a country of cheap labour, like India, this is a matter of small importance. The most popular form

of wire wheel appears to be the Rudge Whitworth. This has an automatic locking arrangement in the hub cap which makes accidental detachment impossible. They are, I understand, rather expensive, a set of five wheels of the 815×105 mm costing £30 in England which would probably cost about £43 in India or Rs. 645. Some of the importing firms quote extra prices for providing these detachable wheels in place of the wooden artillery type. I have seen some Riley detachable wheels which are much less costly and, so far as I could see, were just as well made and equally suitable for use in this country. There is one form of wheel which appeared to me to be specially suitable for use in the tropics. This is to all appearance a wooden artillery type, but really is a pressed steel wheel The name is, I believe, the "Sankey" It is said to [illegible]

[illegible] remote [illegible] ess that [illegible]

[illegible]

I have had no opportunity to inspect any forms of detachable rims, and so I cannot offer any opinion as to their suitability.

OVER-HEATING.

[illegible] has in any case been accused of over heating [illegible]

have been stated to be free from over-heating troubles, are provided with thermo syphon cooling and such being the case this system may be accepted as entirely satisfactory. The difference between the English summer heat and that of the hot weather in India is not so very startling when the high temperatures at which internal combustion engines work most economically are considered. When a car is provided with a properly designed thermo syphon system of cooling with large waterways and the number of bends reduced to a minimum a pump many be regard- [illegible] One point very much in favour of the [illegible]

It will generally be found that when over-heating occurs in modern cars of a good make it can be traced to one or more of the following causes :—

(a) Grease on the radiating surfaces.

(b) Carburetter giving too rich a mixture.

(c) Under-lubrication of engine.

(d) Partial closing of the exhaust through sooting of the silencer.

(e) Wrong timing of the engine.

The [illegible] of these cars for use in the col [illegible] radiator [illegible] ample wa [illegible] gained from the working of cars purchased by Government, I think it is safe to conclude that the modern car of good make is amply provided with means for efficient cooling. Other things being equal, I would give the preference to the thermo syphon system for the reasons given above.

BODIES.

With regard to the relative merits and cost of English and Indian built bodies I have obtained some figures from the Bombay Motor Company. These figures show a saving of about Rs. 100 in favour of the Indian made body.

The Bombay Motor Company recommend English built bodies, but this recommendation is not endorsed by other firms, and nearly all the private owners I have consulted are strongly in favour of the locally built body on the ground that it lasts longer and is not so liable to warp. From my own inspection I am quite convinced that the Indian made body, when supplied by a good firm, such as Dykes and Company of Calcutta, is quite up to the home product in finish and is more likely to stand the climate. While in Poona I had the opportunity to carefully inspect the landaulette body of an Italian chassis which was said to have been built in 1907 by Messrs. Dykes and Company. The body work had not warped to any appreciable extent and the doors fitted perfectly. The Manager of Messrs. Kilburn's shops at Russa also strongly recommends having the bodies of cars built locally, for the above reasons. All bodies for cars imported by them are built by Messrs. Dykes and Company.

I found that most of the importers of cars preferred not to take the risk of danger which is likely to occur to the body work of cars imported complete. There does not appear to be any advantage gained by importing cars with English bodies when the Indian made bodies are found from experience to be quite satisfactory and slightly less expensive.

Comparison of cost of car fitted with an English and Indian body—12—14 H. P. Fiat—

		£	s.	d.	
Cost of English body in England *plus* import duty		65	0	0	
Freight		11	0	0	
5 per cent. import duty on freight		0	11	0	
	Total ..	76	11	0	
		£	s.	d.	
Indian made body Rs. 1,050 = £70-0-0	Difference ..	6	11	0	= Rs. 98

In all cases whether the bodies of cars are of European or Indian manufacture it should be specified that the panels should be of aluminium or some other metal not liable to corrosion. Steel as a material for the panels of motor cars is quite unsuited for the Indian climatic conditions as it is so liable to be attacked by rust, especially in the neighbourhood of the sea. For use in country districts when a car is liable to rough usage and considerable exposure I would recommend that it be painted with ordinary oil paint which can be frequently renewed at small expense and, after a couple of seasons, it will be found that a car which has been treated in this way has the advantage in appearance of a car which was originally sent out with a highly polished surface. The cost of varnish is much greater than that of oil paint and, as a preservative, the latter has the advantage. Floor boards should not be covered by rubber matting which will rapidly deteriorate under exposure to the Indian sun and soon gives an unnecessarily dilapidated appearance to the car. Nothing can be neater or more suitable than having the floor boards covered with aluminium. The Cape cart hoods provided to some cars which I inspected were defective in that the covering was not sufficiently waterproof.

TYRES.

Although the reduction in the consumption of petrol receives as a rule more consideration than the preservation of the tyres, it is on the latter that the economy in working the car chiefly depends. Careful driving and systematic inspections and repairs will go far towards reducing the expenditure on renewals.

In the first place, it is the generally expressed opinion of all the experts whom I have consulted on the subject that large wheels and heavy tyre sections are, though their first cost is heavy, more economical in the long run. From the enquiries I have made it seems that 810 × 100 mm. is the satisfactory minimum, but that 815 × 105 mm. would in most cases be better.

As to the particular make of tyre which is most suitable for India opinions differ very considerably, but the following three makes have, as a rule, been well spoken of :—

Dunlop heavy grooved sections.

Mechelin heavy.

Kempshall rubber non skid.

Helsby tyres have been said to give good results in England, but I have not met with any user of this make of tyre in India. The very poor results which have attended the use of certain well-known makes of tyres out here are due, no doubt, to their having been purchased from Agents in this country who frequently supply tyres which have been stocked for a considerable time, and which have practically perished from climatic effects. I would strongly advocate getting all tyres from England direct and insisting on the suppliers giving the date of manufacture. The great enemies to rubber and canvas, or cord, tyres are light, heat and damp. It will be seen from the opinion of various experts whom I have consulted that the rainy season is particularly deadly for a tyre as the canvas rapidly deteriorates, owing to the damp in the atmosphere.

[illegible]

hole that rotting of the canvas foundation sets in. Some form of vulcaniser (the Harvey Forest for choice) should find its place in the equipment of every car, and its systematic use should be insisted on It is a very simple apparatus to use and the results are very satisfactory. Inner tubes should receive the same careful treatment as the tyres.

The damage done to tyres through running them in a deflated condition is well known and I only refer to it here in order to suggest that the motor tyre pump provided as part of the equipment should have a pressure gauge attached, so that the tyres may be pumped up to a definite [illegible]

sections of tyres and heavier weights supported than are recommended in India Dangerous pressures are apt to develop if tyres are pumped up hard and then taken out under a tropical sun. From the opinions expressed by the various car owners and experts whom I consulted in Calcutta, Bombay, Poona and Madras, the average life of a tyre cannot be taken at more than 4,000 miles. Even with a low mileage it is not safe to estimate the renewals at less than one complete set of covers and inner tubes in the year The climate during the rains in the abovementioned places appears to have a particularly bad effect on the canvas foundation which rapidly decays. In the country districts conditions are much more favourable and a much longer life may be safely expected. The wear on the rubber treads is very much less on the [illegible]

or obtain any definite opinion about, tyre protectors, non-skid bands or tyre liners which do not appear to have made much headway in this country. I have heard of Roberts' reinforced liner having given considerable satisfaction at home, but I have had no personal experience of it It is marketed by the Roberts' Non-skid Motor Tyre Company, 13, King Street, Cheapside, E C.

Brakes.

Most of the modern cars inspected by me were provided with brakes of the internal expand- [illegible]

ing shaft should be looked on as an emergency brake only to be used in case of necessity as it [illegible]

gives his reasons in his note already quoted I have not come across any form of front wheel brakes on the cars which I have inspected in India though these are becoming very popular in England owing to the property they have of preventing sideslip. There are several forms on the market, but the " Allen and Liversidge " are the most universally adopted. I can give no quotations of prices.

Ignition.

The difficulty attending the charging of accumulators makes the battery and coil system of ignition very unsuitable for use in places where an electric installation is not available Some years ago there was a general belief that it was difficult to start an engine on the magneto and the older makes of cars, which were provided with a magneto, were, as a rule, provided with a battery and coil as well. The modern type of magneto has been brought to such a pitch of perfection that, except for the convenience of starting on the switch, which is merely a luxury, a battery and coil are quite unnecessary. In no single case amongst the large number of different cars I have inspected, in the course of my investigations, have I come across one where there was any difficulty experienced in starting on the magneto, at the first or second turn of the starting

lever. With an up-to-date magneto, if any difficulty is experienced in starting up the engine, it will be found that, in nearly every case, the fault lies with the carburetter. It may therefore be accepted that the magneto is the most efficient and suitable form of ignition for general adoption in India. When a car is to be used entirely in a presidency town, and there are no difficulties in getting accumulators re-charged, the battery and coil system of ignition is quite suitable, but is a little more expensive to maintain than the magneto. Captain Willis, R.E., strongly recommends the use of the "Lodge" coil when accumulator and coil ignition are adopted. This special coil, which is quite different in principle to the ordinary coil, gives a particularly powerful and hot spark which is proof against sooted plugs and short circuits. Dry batteries are not recommended as their cost is excessive and they have a tendency to run down even when not in use. There are several good makes of magneto which are on the market all of which may be considered equally efficient. They all have a strong family likeness to the "Bosch" magneto which has proved its thorough reliability. It may be accepted as a fact that any modern car, of good make, is certain to be provided with a good form of magneto. Low tension magnetos with separate coils are now practically defunct and need not be taken into consideration. It is desirable that the magneto should in all cases be direct driven from the engine through some form of wheel gearing; chains in this case are an abomination.

Life of a Motor Car.

I have consulted many experienced motorists on this subject, but in no case would any one commit himself to more than the statement, that the life of a car depends completely on the treatment it receives, and that it is within the power of a careless and ignorant driver to completely ruin the best of cars within a very short mileage. Cars have been known, in Europe, to have a useful life of upwards of 100,000 miles; but this may be considered an exceptionally good record. Taking into consideration the rough usage a car is subjected to in this country, owing to bad roads and the inexpert attention it gets, it seems to me that a life of 50,000 or 60,000 is a reasonable estimate, and, taking an average of 5,000 miles run per annum, that would mean a life of between 10 and 12 years. The heaviest drop in the selling value of a car occurs in the first year, and, judging from the perusal of the advertisement columns of the motor publications, the depreciation may be taken as somewhere in the neighbourhood of 20 per cent. After the first year the depreciation seems to be fairly constant, and if the life is to be taken as 10 years, the depreciation may be taken as 20 per cent. in the first year and 8 per cent. in the following years. It would probably be worth while selling a car after eight years' service if its value, which will have decreased by 75 per cent., can be commanded.

Working Cars by Contract.

The 12 H. P. Darracq car used by the Deputy Chairman, Calcutta Corporation, is run on contract by a firm which charges Rs. 170 a month for a mileage of 450 miles. If the mileage exceeds 450 miles in any month a charge of Rs. 2-8-0 for every 25 miles, or part of 25 miles, in excess of the amount is made. The tyres belong to the contractors until they have run for six months. This proviso is included in the contract, so that in case of sudden determination the contract the Corporation would not be able to claim any new tyre which the contractors might have lately supplied. The above contract rates include all charges for running the car, but do not include repairs.

The rates work out as follows :—

	Re.
For the first 450 miles	0·377 per mile.
For all distances over 450 miles	0·1 ,,

This is the only case of a car being worked by contract, the particulars of which I have been able to ascertain during the course of my enquiries.

The Committee wished me to discuss the terms proposed by the Bombay Motor Car Company in the letter, dated the 11th July 1910, form A. D. Frood, Esq., Manager, to the Hon'ble Mr. J. B. Brunyate, I.C.S., C.I.E. The Manager of the Bombay Branch explained to me that the above quoted letter was written under the supposition that large numbers of cars would be required every year, and that the annual turn over would probably exceed a lakh of rupees. Mr. Frood, who wrote the letter, no longer belongs to the Bombay Motor Car Company, and the Calcutta Branch has been closed. The Company are not prepared to make any special concessions to Government now that they understand that the number of cars to be purchased by Government will be very limited.

Chauffeurs.

Too much importance cannot be attached to the selection of competent men as the life of a car is completely in the hands of the chauffeur who can, through ignorance or misuse, entirely wreck it within a very short period. It will be seen from the reports which have been received that the native mistry chauffeur has not earned a good reputation, and, judging by the heavy expenditure incurred in running the various cars, the figures for which have been supplied,

District.	Owner of car.	Pay of chauffeur	Pay of cleaner.
		Rs.	Rs.
Bombay .. .	Executive Engineer, Presidency District	50	...
Calcutta	Deputy Inspector General of Police, Presidency, Calcutta	60	....
Do.	*Collector, 24-Pargannas*	50*	....
Do.	Principal, Bengal Veterinary College ..	50	...
Patna	Commissioner	50	10
Do.	Deputy Inspector General of Police .	50	10 to 5
Ranchi	Superintending Engineer, 8th Western Circle.	40	10 to 5
Orissa	Commissioner	15, 20, 5 (at various times)	Ticca labour.
Burma	Commissioner of Police	40	....
Muzaffarpur	Commissioner	50	10
Punjab	Chief Engineer	60 to 30	....
Madras	Director of Industries	40	....

* Pays Rs. 10 himself in addition.

The average rate appears to be about Rs. 50 which is certainly not too much to pay for an expert mechanic, and any one who is not a trained mechanic should not be put in charge of a valuable car.

The Thomason Civil Engineering College authorities have started a class for training drivers who will receive certificates of competency after they have gone through the prescribed course and have passed a practical examination in fitting, turning, etc. Two grades of drivers will be turned out, as will be seen on reference to Circular (A) below. Only those in grade I should be employed on Government cars, for they will, as a rule, have complete control of a car; most Government officers not having the time or inclination to supervise their work. It is very desirable that a driver should get his training in a Government establishment rather than in the garage of a firm of repairers for whose interests he may have more consideration than those of his employer. The rate of pay of the fully certificated driver, turned out at Roorkee, has been fixed at Rs. 50 per mensem, but in cases this rate would have to be increased in accordance with that ruling the local market. As the number of drivers for Government cars is very limited, it would seem that the classes at Roorkee College should suffice for the whole of India so far as Government is concerned.

GENERAL.

With a view to keeping some check on the consumption of petrol on a car it is advisable that a test run should be made about every three months during which the mileage run, and the petrol consumed, should be accurately recorded. Every car belonging to Government should be provided with means for recording the distance run and one of the simplest milometers takes the form of a dial, which is fixed to the hub of the near front wheel. This is quite a reliable

re transferred and then num-
the shape of the tank is not

rectangular. All that is required to be done when a test run is being made is to scale off the depths of petrol at the beginning and end of the run and the difference is the consumption in pints. Some regular log should be kept of the running of the car so as to check the amount of petrol used and see that it is not diverted from its legitimate use. With automatic systems of lubrication the consumption of oil does not vary much, and if the issues are checked against the mileage it soon becomes apparent if there is a leakage. There is one point about the care of outer covers which, from my observation of many cars in use, I think does not receive the attention it deserves, and that is the rusting of the rims at the bead. During the manipulation of a tyre the paint is liable to get scraped off the rim, leaving it open to be attacked by rust, and a rusty rim means that the surface becomes rough and does not allow the bead to rest sufficiently tightly against the rim to prevent damp entering, which very soon causes the canvas to rot. I do not know whether the rust itself has a bad effect on the canvas or whether it is merely the damp which causes the deterioration. I would suggest that the rims be frequently examined and any tendency to rust immediately checked by polishing off the rust with sand paper and giving the affected part a fresh coat of paint. During the monsoon it frequently happens that a car has to be driven through a few inches depth of water and there is a tendency for the water to creep down along the screws of the security bolts. To prevent this there is a special form of security bolt nut which has an extension closed at the upper end, through which the screwed portion of the bolt passes. With a good washer under this nut there is no possibility for water to find its way to the inside of the cover. I have not met with this form of nut in India, but it is largely used in England. When heavy sections of outer covers are used it is no easy job to get them on and off the rims, especially when it has got to be done by the aid of one pair of hands. In addition to the usual equipment of two or three straight levers and one forked lever it is very desirable that some form of self-holding lever should be kept. There are several different makes on the market such as the "Bobbetts patent," sold by Sankey Bros. of Moston Lane, Manchester, and the "Ideal" slide hook sold by the "Liverpool" Motor Accessories, 20, Conduit Street, Liverpool. The former have been recommended by "The Autocar." The prices are low.

The manufacturers of the most widely used make of ball bearings have lately discussed, in one of the technical motor papers, the best method for their preservation. Ball bearings hold such an important place in the mechanism of a motor car that the suggestions of the makers deserve very careful consideration. They point out that if the bearings could be kept absolutely free of dust and grit and their initial polish did not get destroyed by rust practically no lubrication would be necessary. As, however, dust will creep in unless the whole space between the balls and the ball races are filled up with some medium it is necessary that some form of lubricating grease should be used, of sufficient consistency to completely fill the voids to the exclusion of all damp and dust. It is of the first importance that the lubricant should be such that it contains no free water or fatty acids, and therefore only the very best, and most refined, motor grease should be used. It should be of sufficient body not to run out of the bearings when they get warm, and care should be taken that the bearings are packed absolutely full, leaving no spaces. This can best be accomplished by a grease injector pump which will screw on the hub in place of the hub cap. Such a fitment can generally be obtained from the dealers in accessories. In no case should oil be used for the ball races of the wheels, which are exposed to dust and wet mud, as the latter will certainly find their way in eventually and the bearings will be damaged.

A. H. C. MacCarthy.

APPENDIX B.

ESTIMATE OF THE PROBABLE COST OF RUNNING A 12 TO 16 H. P. RENAULT CAR COSTING, IN ROUND FIGURES, Rs. 8,000.

[illegible]

[illegible] the tyres are not neglected. Taking a mileage of 5,000 in the [illegible] 18 miles to the gallon, we have 278 [illegible] *ferent parts of India.*

The following are some quotations—

	Rs. a
Calcutta	1 0 per gallon.
Madras	1 0 per gallon.
Bombay	1 0 per gallon.
Roorkee	1 12* „ „
Shahabad	1 4 „ „
Tirhut	1 2 „ „

* This figure is given by the Principal of the Thomason College, Roorkee.

For purposes of calculation I have assumed a rate of Rs. 1-2-0 *per gallon* which seems to be fair.

The cost of 278 gallons of petrol at Rs. 1-2-0 per gallon comes to Rs 313 nearly, or Rs. 0 0626 per mile run.

The following table shows the cost of tyre renewals of certain cars, figures in connection with which are available. They are all Government cars :—

Name of Car and owner.	Cost of renewal of tyres.	Mileage run.	Cost per mile.
	Rs.		Rs.
8 H. P., Darracq, in charge of the Commissioner of Police, Calcutta.	1,290	62,790	0·0205
10—12 H. P., Humber, in charge of the Inspector General of Police, Bihar Range.	652	8,400	0·0776
10—12 H. P., Clement Talbot, in charge of the Superintending Engineer, Western Circle, Bengal.	2,249	8,982	0·2503
10—12 H. P., Clement Talbot, in charge of the Deputy Inspector General of Police, Burdwan.	343	1,981	0·1731
15 H. P., Humber, in charge of the Principal, Bengal Veterinary College.	2,779	13,140	0·2114
14—20 H. P., Siddeley, in charge of the Executive Engineer, Presidency Bombay.	912	6,480	0·1407
12 H. P., Clement Talbot, in charge of the Superintending Engineer, Central Circle, Calcutta.	962	7,000	0·1374
10—12 H. P., Argyll, in charge of the Commissioner of Patna.	144·5	3,000	0·0481
8 H. P., Swift, in charge of Director of Industries, Madras	718	4,300	0·1669
		9)	1·2260
		Average ..	0·1362

I do not place much reliance on the above figures, as in nearly each case the mileage is an assumed one which is not likely to be, even approximately, correct. Also it should be kept in mind that the figures have to do, for the most part, with cars of low horse power, provided with small wheels and, therefore, fairly cheap tyres. The figures for the 14 H. P. Siddeley car may be taken as absolutely correct as the mileage was automatically recorded. The charges for tyre renewals vary so much from year to year that it would require accurate records for many cars extending over a series of years before fairly average results could be arrived at. Major Atkinson, R.E., Principal of the Thomason College, Roorkee, has allowed for five new tyres and inner tubes per year in his estimate, but the prices he quotes appear to be very low compared with those now charged. I have, in my previous note, mentioned that it is not safe to estimate for less than four completely new tyres during a year, even under the most favourable conditions. As however, Government cars do not, as a rule, work under particularly good conditions, and as most of the experienced motorists I have consulted have expressed the opinion that four new tyres would not be quite sufficient a provision, I have assumed that not less than five new tyres will be required. Inner tubes can be repaired so easily that they should last longer than the tyres and I have, therefore, assumed that four new tubes will be required. The cost of one tyre 815×105 (Heavy Grooved Dunlop) is Rs. 162 and the cost of a similar sized inner tube is Rs. 52. The cost of five tyres and four inner tubes is therefore Rs. 1,018 and taking the mileage, as before, at 5,000 we get the cost per mile to be Re. 0·2036.

Taking the consumption of lubricants at 1 gallon to 300 miles (this includes grease) we get $\frac{5,000}{300}$ = 16·66 gallons during the year and this at Rs. 5 per gallon comes to Rs. 83·30 and the cost per mile run works out to Rs. $\frac{83.30}{5,000}$ = Re. 0·0166. Captain Willis, R.E., has suggested that the cost of lubricants should be about 25 per cent of the cost of the fuel. The cost of the fuel, as already found, is Rs. 313 and 25 per cent. of this comes to Rs. 78 which is a fairly close approximation to the figure arrived at above. The Superintending Engineer, Central Circle, Calcutta, has given separate figures for the cost of petrol and lubricants from which it appears that the cost of the latter is 27 per cent of the cost of the former and the cost per mile works out to = Re. 0·024. The Executive Engineer, Presidency District, Bombay, supplied me with separate figures for the consumption of petrol and lubricants from which the cost of the latter works out to about 36 per cent of the former and the cost per mile works out to $\frac{90}{6,480}$ = 0·0138 or, say, Re. 0·014 where 6,480 was the mileage run. This last officer, however, obtained his petrol at the abnormally low rate of annas eleven per gallon which interferes with the comparison. Mr. Oakley, Secretary to the Bengal Motor Association, has expressed the opinion that a car should not consume more than one gallon to 500 miles. This is a figure to which it is, no doubt, possible to work by exercising the very greatest care in the use of the oil, but it is evident, he has made no provision for waste and over-lubrication, which will occur under ordinary conditions of running. It would seem that Re. 0·0200 may be accepted as a fair average under ordinary running conditions. This provision errs on the liberal side which is, I think, advisable as it seems to be bad policy to restrict lubricants.

The Superintending Engineer, Central Circle, Calcutta, gives Rs. 53 as the cost of minor repairs for a mileage of 7,000 which is at the rate of $\frac{53}{7,000}$ = Re. 0·0075 per mile run. The Executive Engineer, Presidency District, Bombay, gives Rs. 120 as his expenditure on minor repairs for a mileage of 6,480 and this works out to $\frac{120}{6,480}$ = Re. 0·0185 per mile run. The Commissioner of Police, Calcutta, ran his 8 H. P. Darracq (single cylinder) car, during five years, a distance of 62,790 miles and the total cost of minor repairs for this period was Rs. 1,476 which is, approximately, Re. 0·0235 per mile. This is a good example of what can be done, and is valuable, as the figures are given for a considerable period. The Superintending Engineer, Western Circle, Bengal, gives the average cost of repairs per mile run as Re. 0·028 for a period extending over three years. It would seem that Re. 0·0250 per mile might be accepted as the fair average cost of minor repairs. In this opinion, I am supported by Captain Willis whom I consulted on this point.

An annual charge for varnishing the car should be included, as this is very necessary for the proper preservation of the body work. If the work is done in one of the public repair garages the cost will probably be not much under Rs. 75 and the charge per mile run comes to $\frac{75}{5,000}$ = Re. 0·0150. If the annual work of varnishing the car is undertaken by a Government workshop the cost would be reduced to some extent. The Executive Engineer at Poona got his car done at a cost of Rs. 50.

The car should be overhauled periodically every three years. This is my own opinion and that of Mr. Oakley and Captain Willis, R.E. The cost may be taken as follows :—

	Rs.	A.	P.
At end of 1st period of three years	200	0	0
2nd	250	0	0
3rd	300	0	0

Captain Willis informs me, on this point, that for the dismantling and re-assembling of a 15 H. P. chassis, with such small repairs and adjustments as are likely to be necessary, the above figures are slightly higher than he would charge were the work undertaken in

the Mint workshops. He therefore considers them reasonable in view of the higher rate of profit that a private firm would charge. The car is assumed to be sold after a life of ten years so the annual cost would be Rs. $\frac{750}{10}$ =75 and the cost per mile (assuming 5,000 as the annual mileage) works out to $\frac{75}{5,000}$=Rs 0·0150.

I have assumed a chauffeur's wages to be Rs. 50 per mensem, which appears to be the average rate allowed in most parts of India, though Captain Willis, R.E, whom I consulted on the point considers that this is the very [illegible]

[illegible] special rate appears to be necessary when the car is used in the vicinity of Calcutta The Executive Engineer, Presidency Bombay, makes an allowance of Rs 65 every two years for chauffeur's clothing. This is Rs. 32·5 per year. It would be better to supply a new uniform every year, and this could be got for Rs. 30 An over-coat for the winter every four years costing Rs 40 might be also provided. Karkee uniforms are much the best as they are fairly durable, cheap and do not show dirt so much as those of other materials. The annual charge would therefore be 30+$\frac{40}{4}$=Rs 40.

A cleaner on Rs 5 per mensem would most probably be required, as qualified drivers in India seem to have a rooted objection to doing anything but drive and attend to the mechanism of a car The total annual cost of the chauffeur, cleaner and the chauffeur's uniform would be Rs 600+40+60=Rs 700 and the cost per mile run would be Rs 0 140.

The usual garage charge for Calcutta, Madras and Bombay is Re. 1 per day and when a car has to be kept in one of these public garages the annual cost comes to Rs. 365 and the cost per mile $\frac{365}{5,000}$=Re. 0 0730.

In nearly every case, when a car is kept in the mofussil, a special garage is unnecessary. Usually there is a coach-house available in which the car can be housed.

If, however, no such accommodation is avaialble a special garage would have to be put up which might be, say, 20 feet long by 12 feet wide internally, provided with a tiled roof, cement floor, inspection pit and suitable lockers in which to keep spares. The cost may be taken as follows 15′ 4″× 13′ 4″= 204 4, say 205 square feet plinth area, at Rs 2-8 per square foot=Rs 512. A separate store for petrol should be provided, isolated from the garage and other buildings, and this would conveniently consist of a corrugated sheet iron lock-up standing on a masonry plinth The dimensions (internal) might be 5′×3′×3′ which would hold (assuming that a 2-gallon tin occupies a space of half a cubic foot) over 80 tins which is more than sufficient The cost of such a lock-up would be Rs 40.

Even when there is room available for storage of the car n a coach house it is advisable to have a safe and isolated lock-up for the stock of petrol, and in all cases when the car is not kept in a public garage, the provision of a petrol store should be made.

Th[illegible] be taken as 6 [illegible] run. The intere[illegible] up comes to Rs. $\frac{6}{100}$×40=Rs. 2·4 or=Rs. 0 0005 per mile run

In my former note I have placed the depreciation at 20 per cent during the first year and 8 per cent in the subsequent years Assuming that the cost of the car was Rs 8,000, and that it is insured each year on its then value, after deducting the depreciation, we have—taking the rate of insurance at 3¼ per cent

	Rs			Rs.
1st year 3¼ per cent on	8,000			260·0
2nd " " "	8,000	less 20	depreciation	208·0
3rd " " "	8,000	" 28	"	187·2
4th " " "	8,000	" 36	"	166·4
5th " " "	8,000	" 44	"	145 6
6th " " "	8,000	" 52	"	124 8
7th " " "	8,000	" 60	"	104 0
8th " " "	8,000	" 68	"	83·2
9th " " "	8,000	" 76	"	62 4
10th " " "	8,000	" 84	"	41·6
11th " " "	8,000	" 92	"	20·8
12th " " "	8,000	" 100	"	0·0

If the car is sold after 10 years we should have paid Rs. 1,383 in premia and the charge per mile run would be $\frac{1,383}{5,000\times 10}$ = Rs. 0·0276.

The first cost of the car, complete, being taken at Rs. 8,000, the cost to Governmen at the end of ten years (the assumed life of the car before it is disposed of) at 3½ per cent. compound interest will be Rs. 11,284·8. The car at the end of ten years should, if it has been properly overhauled, be saleable for not less than Rs, 1,000. This being credited to Government on realization reduces the cost to Government to Rs. 10,284·8. In order to charge off both the interest and depreciation as a mileage cost it will suffice if we set aside yearly a sum which if allowed to accumulate at 3½ per cent. will amount in ten years to Rs. 10,284·8 as above. This yearly sum is Rs. 876-7 (see ordinary annuity tables) say Rs. 877. This on a yearly assumed mileage of 5,000=Rs. 0·1754 per mile run.

Taking the case where a car is housed in a public garage the charges amount to the following for each mile run :—

Cost of running per mile including all charges.

	Rs.
Cost of petrol	0·0626
" tyre renewals	0·2036
" lubricants	0·0200
" minor repairs	0·0250
" annual varnishing	0·0150
" periodical overhaul	0·0150
" pay of chauffeur " pay of cleaner " uniform of chauffeur	0·1400
" garage	0·0730
" insurance	0·0276
" interest on capital cost and depreciation	0·1754
	0·7572

If a garage and petrol lock-up are required the charge would be modified to 0·6908.

If only a petrol lock-up is required the charge would be 0·6847. Mr, Oakley, Secretary to the Automobile Association of Bengal, gives a figure of ½ anna per horse-power per mile which he considers may be considered a fair standard for the cost of working a car. In the case of a 16 H. P. engine this is Rs. 0·5. This does not include the items interest and depreciation, insurance and garage charges.

If these items are added his figure works out Rs, 0·50+0·2760=Rs, 0·7760 which compare rather unfavourably with the figures obtained above.

Major Atkinson, Principal of the Thomason College, has supplied an estimate for running a 15 H. P. car which works out to Rs. 0·5 per mile run, and by adding the cost of insurance, interest and depreciation and garage charges, his figures come to the same as those of Mr, Oakley.

13th December 1910. A. H. C. MacCarthy,

APPENDIX C.

ESTIMATE OF THE PROBABLE COST PER MILE FOR RUNNING AN 8 H P. DE DION SINGLE CYLINDER CAR COSTING WITH ALL ACCESSORIES Rs 5,000.

The consumption of petrol on a light 8 H. P. car should not amount to much. I have

cost per mile run is therefore $\frac{}{5,000}$—Re. 0 0102.

A light car
them, one comple
lowed for. Three ..
cost of one grooved Dunlop tyre 760×90 is Rs. 105 and an inner tube of similar size would cost Rs. 30 Four outer covers and three inner tubes would therefore come to Rs. 510 which works out to $\frac{510}{5,000}$=Re. 0·102.

I have not got any actual
cylinder 8 H P. engine, but I
own case. Taking, as in the ca
cent. of the cost of the fuel we get a figure 201×$\frac{25}{100}$= Rs. 50 nearly and taking the cost at Rs. 5

and makes provision for a certain amount of waste which cannot always be prevented Accepting these figures the number of gallons required would be $\frac{5,000}{400}$=12·5 and the cost at Rs 5 per gallon would be Rs. 62·5 and this works out to Re. 0·0125 per mile.

$\frac{5,000\times0\ 025}{8,000}$=0·0156.

The annual cost of varnishing the car may be taken at Rs. 35 to Rs. 40. I have had it done at Rs. 30, but then I supplied the materials and labour myself. I should say that it is safer to accept the higher limit and in this case the cost per mile run would amount to $\frac{40}{5,000}$ = Re. 0 008.

In the same way as in the case of the 16 H P. car the 8 H. P. should be overhauled *once every three years or after it has run 15,000 miles.* The overhaul of a single cylinder car is not so heavy a job as that of a four cylinder, but the cost is, by no means, in the same ratio as the number of the cylinders. After consulting several authorities on the subject and taking into consideration what the cost would probably have been, in my own case, if I had given the work to a private firm, I am of opinion that the cost cannot be put down at less than the following :—

	Rs.
1st period of three years ..	150
2nd „ „ „ ..	200
3rd „ „ „ ..	250

The annual cost therefore works out to Rs. 60 and the cost per mile run 0 0120 (taking the life of the car at 10 years).

I am strongly of opinion that it is just as necessary to have a thoroughly trained chauffeur for a small as for a big car, and so the charge under this head would be, *as in the case of the* 16 H P. car, Re 0·140 per mile run.

The garage charge for a small car is about Re 0 66 per day, *i e.*, Rs. 20 per month. The cost per year would be Rs. 12×20=Rs. 240 and this comes to $\frac{240}{5,000}$=Re. 0·048 per mile run.

The cost of a garage and petrol store would be practically the same as in the case of the 16 H. P. car. *And the cost per mile run may be taken at*—

	Re.
Garage ..	0 0061
Petrol lock up ..	0·0005

Assuming the cost of the car at Rs. 5,000 and that it is insured each year on its then value after deducting the depreciation we have, taking the rate of insurance as 3¼ per cent.—

			Rs. per cent.	Rs.
1st	year 3¼ per cent on	..	5,000	162·5
2nd	" " "	..	5,000 less 20 depreciation	130·0
3rd	" " "	..	5,000 " 28 "	117·0
4th	" " "	..	5,000 " 36 "	104·0
5th	" " "	..	5,000 " 44 "	91·0
6th	" " "	..	5,000 " 52 "	78·0
7th	" " "	..	5,000 " 60 "	65·0
8th	" " "	..	5,000 " 68 "	52·0
9th	" " "	..	5,000 " 76 "	39·0
10th	" " "	..	5,000 " 84 "	26·0
11th	" " "	..	5,000 " 92 "	13·0
12th	" " "	..	5,000 " 100 "	0·0

If the car is sold after ten years we should have paid Rs. 864·5 in premia and the charge per mile run would be Rs. $\frac{864 \cdot 5}{5,000 \times 10}$ = Re. 0·0173.

The first cost of the car complete being taken as Rs. 5,000 the cost to Government at the end of ten years (the assumed life of the car before it is disposed of) at 3½ per cent. compound interest will be Rs. 7,053. The car at the end of ten years should fetch not less than Rs. 500. This being credited to Government on realization reduces the cost to Government to Rs. 6,553. In order to charge off both interest and depreciation as a mileage cost it will suffice if we set aside, every year, a sum which if allowed to accumulate at 3½ per cent. will amount to Rs. 6,553 in ten years' time. This yearly sum is Rs. 559 and the yearly mileage being assumed at 5,000 the rate per mile works out to Re. 0·1118.

Taking the case when the car is housed in a public garage the charges amount to the following for each mile run :—

	Rs.
Cost of petrol	0·0402
" tyre renewals	0·1020
" lubricants	0·0125
" minor repairs	0·0156
" annual varnishing	0·0080
" periodical overhaul	0·0120
" pay of chauffeur " pay of cleaner " uniform for chauffeur	0·1400
" garage	0·0480
" insurance	0·0173
" interest on capital cost and depreciation	0·1118
Total	0·5074

If a garage and petrol lock-up are required this charge will be altered to Re. 0·5074—Re. 0·0480+0·0066=Re. 0·4660.

If only a petrol lock-up is necessary the charge will be altered to Re. 0·5074—0·0480+0·0005=Rs. 0·4599.

A. H. C. MacCarthy.

APPENDIX D.

SPECIFICATION OF MOTOR CAR FOR THE USE OF GOVERNMENT OFFICERS IN INDIA.

(1) The Horse-power to be not less than 12 and not greater than 16; worked out from Mr Worby-Beaumont's horse-power tables at 1,000 revolutions.

(2) *Frame*—The frame to be of pressed steel.

(3) *Engine.*—The engine to be of the four-cylinder, four-stroke type; water cooled with large waterways round the cylinders and exhaust valves. The valves to be of the ordinary tappet type. It would be advisable to have them enclosed by easily removable observation plates. The tappets should be adjustable. Inlet valves should be mechanically operated and interchangeable with the exhaust valves. The cylinders should be cast in pairs and not "en bloc". A good undershield should be provided as a protection against dirt

(4) *Cooling.*—This should be automatic by the thermo-syphon system. The waterways [illegible] *be a minimum. The radiator* [illegible] ferably of copper-gilled tubing [illegible] omb type.

(5) *Clutch.*—The clutch should be either of the leather cone internal type placing no thrust on the engine or of the single plate metal-to-metal description requiring no lubrication A good flexible coupling to be provided between the clutch and the gear box.

(6) *Gearbox*—This should provide three forward speeds and reverse, actuated either by [illegible]

(7) *Transmission.*—The drive should be by Cardan shaft to crown bevel in the back axle. [illegible]

(8) *Brakes*—The brakes should be of the internal expanding type properly protected from dirt and wet. The brake on the countershaft should, for choice, be worked by the side hand lever and be considered the emergency brake The brakes on the back wheels may be worked by a foot-pedal and it is of the greatest importance that they should have their levers tho- [illegible] even in their [illegible] steering pivot [illegible]

(9) *Wheels*—The wheels to be all metal, detachable, of either "Sankey", Rudge Whitworth or Riley pattern. A fifth wheel to be provided as a spare, properly mounted on the running board on the off-side of the car. The front wheels to be provided with some form of side thrust bearings, either ball or roller-type.

(10) *Steering.*—The worm and nut mechanism to be provided in preference to the worm and quadrant. Thrust bearings to be provided above and below the worm on the steering column.

(11) *Ignition*—High tension magneto ignition to be provided which should admit of advance and retard of the spark.

(12) *Springs*—The springs to be very strong though flexible when the car is to be used on katcha roads Rubber or other form of buffers to be provided to absorb road shocks All spring shackles to be *provided with grease cups*

(13) *Lubrication*—Lubrication should be automatic by pump instead of exhaust pressure and a suitable indicator should be provided to show if the system is working properly

Clearance.—The clearance under the differential casing and the front axle should not be less than ten inches when the tyres are fully inflated

(14) *Bodies.*—The bodies should be constructed in India by approved firms as such bodies last better than the home-manufactured articles. The panels should be of aluminium or other non-rusting metal Lead plated steel should not be used as paint will not adhere to it properly. Footboards may be plain or covered with aluminium chequered plates Rubber matting is not suitable for use in the tropics.

(15) *Equipment*—In addition to the tools which usually accompany a chassis the following should be added:—A milometer fitted to the hub cap of the near front wheel A pressure gauge for use in regulating the tyre pressure One grease injector for greasing the wheels, fitted so as to scr [illegible] for the purpose. [illegible] plain and one for [illegible] exhaust and inlet valves.

A. H. C. MacCARTHY

The 13th December 1910

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